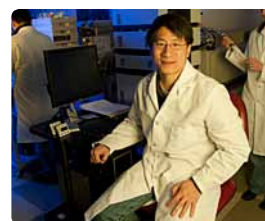
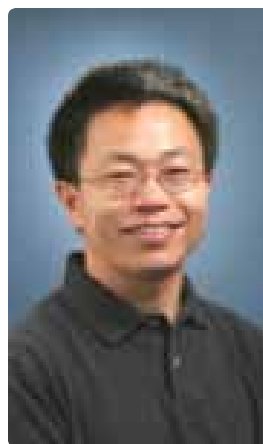
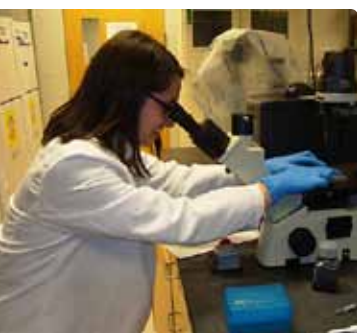
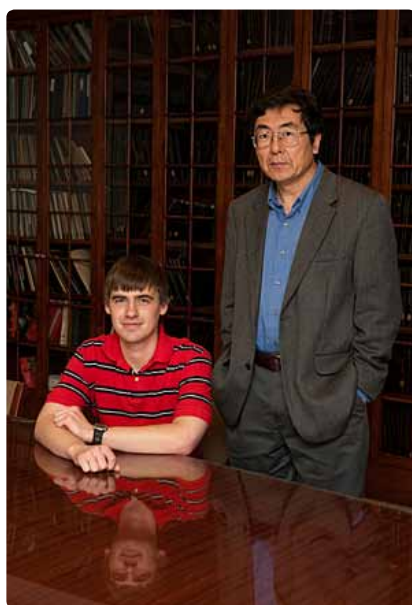
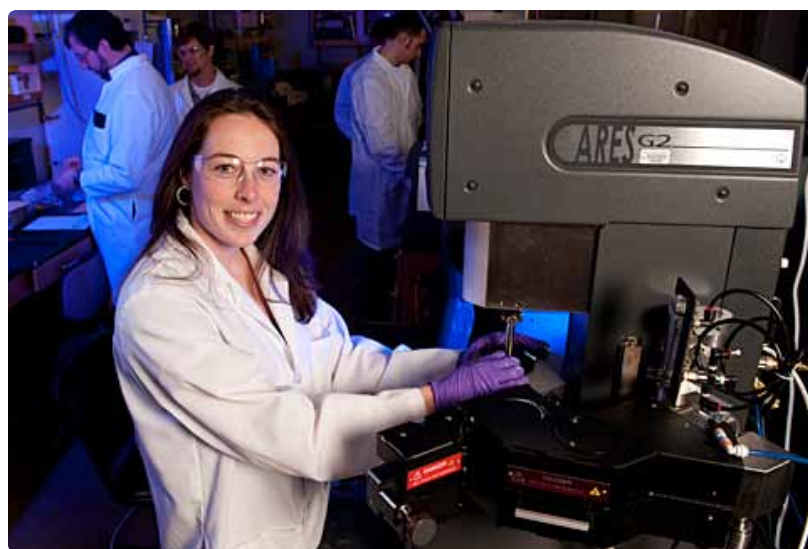


# 2011 Chemical Engineering *News*



AICHE Delaware Alumni Reception  
7–9 p.m. Monday, October 17, 2011  
Minneapolis Convention Center  
Minneapolis, MN

[www.aiche.org/annual](http://www.aiche.org/annual)



# Message from the Chair

As I write this message I am watching the new Interdisciplinary Science and Engineering Laboratory (ISE Lab) being erected across Academy Street—a world-class facility suitable for a world-class faculty's research and teaching.

This construction reminds me that we—the faculty, staff, students and visiting researchers in chemical engineering—are very fortunate to have strong alumni support. This support is critical for hiring the best and brightest faculty and providing the best research and teaching facilities so that we can be successful in our mission of creating knowledge, educating students and improving society.

Indeed, ChE alumni continue to lead giving across this campus just as ChE faculty, staff and students continue to lead education and research initiatives. Your generous giving supports scholarships for highly deserving undergraduates, modern undergraduate laboratory experiments and the best and brightest graduate students to conduct research with the most distinguished faculty in the world on problems of truly global significance.

As importantly, you comprise an alumni network that is providing quality internships and employment opportunities for our students. Alumni also contribute expertise to our educational program through special lectures, co-teaching of classes, and in our new Leadership and Entrepreneurship class, as well as service on our advisory council. You can read more about these alumni activities in this year's bulletin. A sincere thanks to all of you for your continued engagement in the department!

Please consider attending to our Delaware Alumni Reception, which will be held Monday, October 17, 2011 at 7:00 p.m. at the AIChE national meeting in Minneapolis, MN. This year we will be celebrating the arrival of new faculty: Prof. Wilfred Chen (Gore Prof.), Prof. Yushan Yan (Distinguished Alumni Prof.), new Assistant Professor April Kloxin and two new Research Assistant Professors, Yun Liu and Chris Kloxin. Among

the many achievements, we will be celebrating Prof. Fraser Russell with a banquet on Sunday, October 16th and symposium October 17th in honor of his 2010 Lewis Award, and the announcement that Professor Dion Vlachos will receive the 2011 Wilhelm Award on Sunday, October 16th. Read on for more information about these and the many other awards and activities of the faculty and students.

Much of the recent growth in the Department has been in two areas—energy and biochemical/biomolecular engineering. This follows a decade long strategic plan that received strong support from our administration, making Delaware a world-recognized research and education leader in these critically important areas. These are highlighted throughout this year's bulletin and further exciting developments in the bioengineering area within the department and college will be forthcoming—stay tuned!

Finally, mark your calendar for the chemical engineering department's centenary celebrations—yes, the UD Board of Trustees officially approved the ChE degree in 1914 and the first degree was granted in 1915. If you have historical information concerning the department, we would welcome you sharing it with us as we prepare for this momentous occasion!

Best wishes to you and your family for the year to come!



**Norm Wagner**

Alvin B. & Julia O. Stiles  
Professor & Chair  
Department of Chemical  
Engineering

# INTRODUCTION

Looking for an old friend?

Want to share your latest news? Searching for information on upcoming alumni events such as Homecoming? Now you can do it all in one place, [www.UDconnection.com](http://www.UDconnection.com).

Check us out on Facebook:

*University of Delaware  
Chemical Engineering*



**4**

**FACULTY**

**14**

**STUDENTS**

**18**

**RESEARCH**

**20**

**ALUMNI**

**40**

**DEPARTMENT**

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## Engineering leadership change

Babatunde A. Ogunnaike, William L. Friend Chair of Chemical Engineering at the University of Delaware, has been named interim dean of the College of Engineering, effective July 1.

He succeeds Michael J. Chajes, who concluded his service and returns to the faculty as professor of civil and environmental engineering.

He was appointed William L. Friend Professor of Chemical Engineering in 2004 until his promotion to William L. Friend Chair in 2008. He was named deputy dean for the College of Engineering in 2010.

An outstanding scholar and mentor, Ogunnaike earned a bachelor's degree in chemical engineering from the University of Lagos in Nigeria in 1976 and a master's degree in statistics and a doctorate in chemical engineering from the University of Wisconsin Madison in 1981.

He has won a number of awards, including the Donald P. Eckman Education Award from ISA, an international organization involved in instrumentation, systems and automation, in 2007. In 2008, he received the American Automatic Control Council's Control Engineering Practice Award. He also has received the College of Engineering's Excellence in Teaching Award.

The author or editor of four books and more than 75 papers and book chapters, Ogunnaike has served as associate editor of the Institute of Electrical and Electronics Engineers' *IEEE Transactions on Control Systems Technology*, and he is associate editor of the American Chemical Society's *Industrial & Engineering Chemistry*.

He has delivered more than 100 seminars at universities, conferences, symposia and companies, and his textbooks have been used to educate and train engineers in instrumentation, systems and control at more than 29 universities.

Provost Tom Apple calls Ogunnaike, the current deputy dean for the college, a distinguished engineering educator whose career encompasses industrial experience, academic prowess and expertise with international knowledge-based partnerships.

"Tunde's leadership and teaching have had a profound impact on the development of thousands of engineers and industrial practitioners," Apple said. "His experience and familiarity with the college's vision make him an ideal individual to take on this expanded leadership role and I am confident that under his direction, the successes and trajectory of the College of Engineering will continue to make an impact in research, graduate and undergraduate education."

"I look forward to working with the faculty, staff and University administration to continue developing strong partnerships and initiatives that will propel the college along its strategic plan, which is aligned with the University's Path to Prominence™," said Ogunnaike.

Ogunnaike joined the UD faculty in 2002 as a professor with dual appointments in the Department of Chemical Engineering and the Delaware Biotechnology Institute's Center for Systems Biology, following a 13-year research career with DuPont.





## Yushan Yan joins Chemical Engineering, UDEI

World renowned researcher Yushan Yan is known for his work using nanomaterials to solve problems in energy engineering, environmental sustainability and electronics.

His research group was the first to demonstrate the use of zeolite thin films for semiconductors and aerospace applications and new materials for fuel cells, energy storage and solar hydrogen generation.

Yan joined the College of Engineering July 1 as Distinguished Professor of Engineering, the first college level professorship of its kind. He will have dual responsibilities within the Department of Chemical Engineering and the UD Energy Institute (UDEI).

"Providing clean, efficient and safe sources of energy is one of the most critical challenges facing our society. Yushan is an important addition to the college and to the research programs focused on these issues at the University level," according to Babatunde A. Ogunnaike, interim dean of engineering.

Yan's current research thrusts include the development of new fuel cell catalysts and membranes to reduce the cost and improve the durability of fuel cells.

Yan previously served as Presidential Chair of the Department of Chemical Engineering at the University of California, Riverside, where he was

one of five inaugural UCR University Scholars.

The decision to leave, he said, was not an easy one.

"Academically speaking, I was born and grew up at UCR, so it is like leaving home for the first time," Yan explained. "With the significant investment UD is making in energy and environmental research, it is an exciting time to join UD. I look forward to working with my colleagues at various departments and centers, including the Center for Catalysis Science and Technology, the Catalysis Center for Energy Innovation and the UD Energy Institute."

Yan received his bachelor's degree in chemical physics from the University of Science and Technology of China in 1988. He earned his master's and doctoral degrees in chemical engineering from the California Institute of Technology in 1995 and 1997, respectively. He also studied at Dalian Institute of Chemical Physics of the Chinese Academy of Sciences before beginning his doctoral work in 1992. He is the inventor of a large number of issued or pending patents, several of which he has licensed to form startup companies.

# Faculty Honors & Awards



**MACIEK R. ANTONIEWICZ,**

DuPont Young Professor in the Department of Chemical Engineering at the University of Delaware, has

been awarded a prestigious National Science Foundation (NSF) Faculty Early Career Development Award to study the role of metabolism in cellular behavior.

The NSF Career Award, which includes a \$400,000 grant, will support Antoniewicz's research and education program at UD on metabolic engineering and systems biology.

Antoniewicz's research proposes to quantify the metabolic state of cells using a novel measurement technique called tandem mass spectrometry. A powerful tool for obtaining structural information of molecules, tandem mass spectrometry has previously been used to reveal the structure of a variety of small to medium sized molecules, including organic molecules, lipids and fatty acids, peptides, carbohydrates, as well as DNA and RNA adducts.

Antoniewicz intends to develop a new and universal framework for using tandem mass spectrometry and stable-isotope tracer experiments for elucidating complex biological network models and estimating metabolic fluxes. He hopes this work will provide the groundwork needed to advance applications such as engineering organisms to make alternative fuels and developing next generation drugs to treat metabolic diseases.

If successful, his work will introduce a new method of MFA, provide improved techniques for validating flux results and improve basic knowledge on metabolic network operations of two important microorganisms, *E. coli* and yeast.

Under the grant, he also hopes to incorporate quantitative systems biology principles as an integral part of chemical engineering education at UD and increase the participation of underrepresented student groups in research, which he says will "contribute to the training of a new generation of engineers and scientists needed to drive the emerging field of systems biology and its biological applications."

"The project provides unique opportunities to train and educate students in an interdisciplinary environment," explained Antoniewicz. "Infusion of state-of-the-art research into a classroom firmly based in biological principles will better prepare students to make intelligent and effective decisions in their future careers in biotechnology and related fields."

Antoniewicz has won a number of international honors and awards, including the 2008 DuPont Young Professor Grant and the 2008 James E. Bailey Young Investigator Award in Metabolic Engineering.



**JINGGUANG**

**CHEN,** Claire D. LeClaire Professor of Chemical Engineering, has received UD's 2011 Excellence in Advising and Mentoring Award,

an honor based on student nominations. Recipients receive \$2,500 and an inscribed brick in UD's Mentors' Circle.

"I interact with undergrads mainly as their research adviser. My philosophy on advising is to first identify the education background and research interest of an individual student. I then choose a research topic that matches his/her interest. During the course of research, I provide guidance but strongly encourage the student to work independently.

Many of the undergraduates from my group went on to top graduate schools; and two students won the prestigious Goldwater Fellowship, the highest honor for engineering undergraduate students," reflected Chen.

Chen also received the 2011 Herman Pines Award in Catalysis at the 2011 Catalysis Club of Chicago Spring Symposium in Naperville, Illinois. Given annually, the award recognizes an individual with significant contributions to catalysis in either fundamental research or industrial processes.

A world leader in surface science studies of carbide and bimetallic catalysts, Chen's work has shortened long standing materials and pressure gaps critical in converting fundamental science to industrial practice using a unique combination of surface science, theoretical modeling, catalysis and in-situ reactor studies, leading to the development of novel concepts and catalytic materials for a wide range of chemical reactions.



**WILFRED CHEN,**

Gore Professor of Chemical Engineering, was elected to the American Institute for Medical and Biological Engineering

(AIMBE) College of Fellows, Class of 2011, for his notable contributions in environmental biotechnology and biosensing of pathogens, and for pioneering synthetic cellulosomes for bioethanol production.

*(continued)*



## Leadership, service, vision

**DR. MORTON COLLINS, B 1958**, is an institution in the Department of Chemical Engineering at the University of Delaware.

From his early days as a student to his dedicated service as chairman of the Advisory Council over the past 26 years, Collins has worked tirelessly to promote, grow and prosper the department.

Collins, general partner of Battelle Ventures and Innovation Valley Partners, was honored October 13, 2010, for his over 26 years of service.

### Leadership

"Mort brought leadership to our department," said T.W. Fraser Russell, Allan P. Colburn Professor Emeritus in the Department of Chemical Engineering. "The presence of the advisory council has been a terrific morale booster to the faculty. If you look at rankings, the University of Delaware is by far the smallest university in the high end chemical engineering programs."

The advisory council's function is to assist the department in managing the needs of faculty, staff and students. As chairman, Collins has been the voice of the department within the broader university community, meeting with deans of engineering, the president of the University and the provost annually to address departmental needs. Dr. Collins, among his many philanthropic activities, has endowed a graduate fellowship in the chemical engineering department at the University of Delaware.

"It is critical when you are trying to improve a program that you have someone involved that understands the non-quantifiable values of that program," explained Russell.

"Mort understands what the department does beyond sponsored research, beyond the papers and other things because of his business experience. In my view, he understands that the most important thing universities do can't be measured, they have to be felt by the faculty, staff and the students they impact."

"The University of Delaware had a dramatic impact on my life. My entire awakening to all things cultural and otherwise happened here at this University," recalled Collins, a 1989 University of Delaware Medal of Distinction award winner.

### Service

Collins' career is a testament to hard work, commitment and service. After earning his bachelor's degree in engineering from the University of Delaware, and his master's degree and doctorate in engineering from Princeton University, Collins spent more than four decades impacting the fields of life sciences, electronic materials, communications and software.

In 1968 he founded Data Science Ventures (DSV), a pioneering venture-capital firm specializing in early-stage financing of high-technology companies.

A true visionary, Collins chaired President Ronald Reagan's Task Force on Innovation and Entrepreneurship and served as technology policy advisor to President George H.W. Bush. He served on the New Jersey Governor's Commission on Science and Technology; the New Jersey Governor's Superconductivity Roundtable and is a member of the Research Roundtable of the National Academy of Sciences.

### Vision

During Collins' tenure as chairman of the chemical engineering department advisory council from 1984 to 2010, the department has grown to one of the top ten chemical engineering programs in the nation. Undergraduate and graduate enrollments have grown by 27.7 percent and 27.2 percent respectively, and faculty has increased by 44.7%.

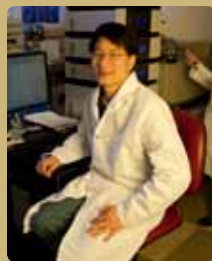
Yet Collins remains humble, listing "telling it like it is" as his biggest contribution.

"I've always tried to support the department, even when that included telling them they were wrong," he said. "This department is the jewel of this University. I'm interested in making this the best [chemical engineering] program in the world."

With quality people, research and programming embedded in the department, Collins believes it's doable. "Good faculty attracts good students and good students attract good faculty," he said.

# Faculty Honors & Awards

(continued)



**KELVIN LEE**, Gore Professor of Chemical Engineering and director of UD's Delaware Biotechnology Institute (DBI), has been elected a

fellow of the American Association for the Advancement of Science (AAAS) at the association's annual meeting in Washington, D.C., Feb. 19. Lee was selected for "distinguished contributions to the development and application of proteomics technology to human health."

Proteomics is an approach to the analysis of proteins expressed in living systems. It is currently of interest because of technology developed over the last decade that enables researchers to generate a protein "fingerprint" for different tissues, allowing researchers like Lee to distinguish unique features of disease at the molecular level.

Lee's research team has been at the forefront of developing next generation tools for protein expression profiling and applying existing tools to specific problems in biomolecular engineering and medicine, with a special emphasis on Alzheimer's disease.



**ABRAHAM M. LENHOFF**, Allan P. Colburn Professor of Chemical Engineering, has won the American Chemical Society's (ACS) 2011 Marvin J. Johnson

Award for microbial and biochemical technology. Presented by the ACS Division of Biochemical Technology (BIOT), this honor recognizes Lenhoff's "scholarly contributions to understanding and manipulating protein behavior in bioseparations by merging biophysical

and colloidal methods with chemical engineering analysis and synthesis."

Lenhoff accepted the award at the ACS 241st national meeting in Anaheim, Calif., March 27-31, where he also delivered the Johnson Award Lecture on his research. He was similarly honored with the ACS award in Separations Science and Technology and the Alan S. Michaels Award for the Recovery of Biological Products from ACS BIOT in 2009.



**RAUL LOBO**, professor of chemical engineering, has been appointed director of the Center for Catalytic Science and Technology

(CCST). His research interests span the development of novel porous materials for catalysis and separations, the chemistry of zeolites at high temperatures, the development of novel photocatalysts for environmental applications and the scientific aspects of catalyst synthesis. He has published over ninety refereed reports and he is co-inventor in three U.S. patents. He earned his bachelor's degree at the University of Costa Rica and his master's and doctorate degrees at California Institute of Technology. After a one-year postdoctoral fellowship at Los Alamos National Laboratory in New Mexico, Lobo joined UD's Department of Chemical Engineering in 1995.

CCST is one of the foremost facilities for catalysis research in academia, providing research opportunities to more than 300 students and postdoctoral fellows in chemical engineering and chemistry & biochemistry since its founding in 1978. The hallmark of the Center's research continues to be its strong connection to industrial practice; ties forged through the Center's Industrial Sponsors Program,

industrially supported grant and contract research, collaborative projects and industrial sabbaticals and faculty research exchanges.



**BABATUNDE OGUNNAIKE**, interim dean of the College of Engineering and William L. Friend Professor of Chemical Engineering,

delivered an invited lecture at the University of Alberta in Edmonton, Alberta, Canada, as part of the D.B. Robinson Distinguished Speaker Series on Feb. 17, an annual event that features lectures by internationally renowned engineers and scientists on a variety of topics. Ogunnaike presented on the computational and process systems approaches to resolving the TGF-beta paradox in cancer.



**ANNE SKAJA ROBINSON**, a leading researcher in the field of biochemical engineering, has been named chair of the Department of Chemical and

Biomolecular Engineering at Tulane University. Robinson will leave the University of Delaware to join the Tulane faculty in Spring 2012. She will also serve as the Catherine and Henry Boh Professor of Engineering at Tulane, an endowed position.

Robinson's research focuses on understanding the fundamental interactions between molecules in isolation and within cells, with a biomedical application. One focus is on those interactions in brain cells, which could have ramifications for neurodegenerative diseases such as

(continued)



## New Leadership— Dr. Thomas F. Degnan

Stepping into the role of Chemical Engineering Advisory Council Chair is fellow UD alumnus **DR. THOMAS F. DEGNAN JR.**, a research executive with ExxonMobil.



Degnan, who took the reins in late 2010, has spent most of his 35 year career at Mobil and now ExxonMobil in the areas of zeolite discovery, synthesis and zeolite catalyst commercialization.

Currently, Degnan is Manager of Breakthrough and Leads Generation for Exxon Mobil Research and Development. He earned a BS degree in Chemical Engineering from the University of Notre Dame in 1973, a Ph.D. from the University of Delaware in 1977, and an MBA from the University of Minnesota in 1980. He has previously worked for 3M Corporate Research (1976-1980) and the Mobil Technology Company (1980-1999). He is a member of several other advisory boards, including those of the School of Chemical Engineering, Purdue University; Department of Chemical and Biochemical Engineering, John Hopkins University, and the Department of Chemical and Materials Engineering at Stevens Institute. He is currently Chairman of the Research & Development Council of New Jersey. Degnan is the inventor or co-inventor listed on over 100 issued United States patents. He was awarded the American Chemical Society Hero of Chemistry Award in 2007 (<http://www.udel.edu/PR/UDaily/2008/sep/hero091407.html>), and the AIChE Chemical Reaction Engineering Award in 2010 for his contributions to industrial catalysis. We look forward to continued excellence in council leadership under Dr. Degnan and with Dr. Collins as immediate past chair.

## Paper documents new solar cell characterization method

**MICHAEL MACKAY BS, 1979**, Distinguished Professor of Materials Science and Engineering and the Department of Chemical Engineering at UD, is co-author of a paper demonstrating a new method for characterizing polymer-based solar cells.

The paper, "Phase-Sensitive Neutron Reflectometry Measurements Applied in the Study of Photovoltaic Films," appeared in the Aug. 21, 2010 issue of The Journal of Chemical Physics. Co-authors include Jon Kiel, Mackay's doctoral student at Michigan State University, and three researchers from the

National Institute of Standards and Technology (NIST).

Mackay explains that polymer-



based solar cells have the potential to supplement ever-increasing demands for energy due to their low cost

and ease of manufacture. However, commercialization will not be feasible until device performance reaches an efficiency level approaching that of inorganic cells, such as silicon solar cells. Achieving this level of performance requires precise control of morphology or structure at the nanoscale, Mackay said.

## EMPLOYEE SPOTLIGHT: Still working at 90

Lucille Wilson was born June 10, 1921, just three months after an Act of the Delaware General Assembly created the University of Delaware with two colleges—Delaware College and the Women's College, and two years before UD launched its first study abroad program to Paris.

An Alabama native, Wilson moved to Delaware in 1956 when her husband joined the DuPont Co. Years later she followed suit, working as a DuPont personnel supervisor for 24 years until her retirement in 1988. She quickly discovered, however, that retirement wasn't for her.

A friend suggested she apply for part-time work in UD's chemical

engineering department, where she remained until joining the College of Engineering Special Business Office in 2010 to help coordinate allocations and expenditures for the college.

T.W. Fraser Russell, Allan P. Colburn Professor Emeritus of Chemical Engineering, said he remembers Wilson as a "very valuable staff person with a good sense of humor" who he often found "working out at 6 a.m." at the Employee Fitness Center.

Wilson marked her 90th birthday on June 9, 2011. She will achieve two more milestones—22 years of service to the University and 46 years in the workforce—this November.

# Faculty Honors & Awards

(continued)

Alzheimer's disease. She is the author of over 55 publications in the field of biochemical engineering. She holds several patents, and is co-author of the textbook, *Mass and Heat Transfer*.

Anne was also elected as an American Institute for Medical and Biological Engineering (AIMBE) Fellow. Elected by their peers, AIMBE fellows are considered to be in the top two percent of the medical and biological engineering fields.



**STANLEY SANDLER**, Henry Belin du Pont Chair of Chemical Engineering, was honored with a special publication of the American Chemical

Society *I&EC Research* for lifelong dedication to the chemical engineering profession. Called a festschrift, German for "celebration publication" presented during one's lifetime (especially in academia), the special issue invited Sandler's colleagues, peers and former doctoral students to contribute original scientific work for publication in his honor.

Sandler is a member of the prestigious National Academy of Engineering and a longtime member of the chemical engineering faculty. He is well known for his research in applied thermodynamics and he has received worldwide recognition as an invited lecturer in the Americas, Europe, Asia and Africa.

UD colleagues and doctoral students who contributed scholarly papers to the publication in Sandler's honor included:

**ALAN L. STOTTLEMYER, ERICH C. WEIGERT**, and **JINGGUANG G. CHEN**; **MICHAEL SALCICCIOLI, YING CHEN, DIONISIOS G. VLACHOS**; **JAMES E. REKOSKE** and **MARK BARTEAU**; **CAROLINA L. BIANCO, CRAIG S. SCHNEIDER, MARIAGABRIELLA SANTONICOLA, ABRAHAM M. LENHOFF** and **ERIC W. KALER**; and **LESLIE V. WOODCOCK**.



**DION VLACHOS**, director of UD's Catalysis Center for Energy Innovation and Elizabeth Inez Kelley Professor of Chemical Engineering, has won the

2011 American Institute of Chemical Engineering's (AIChE) R.H. Wilhelm Award in chemical reaction engineering. Sponsored by ExxonMobil Research and Engineering Company, the honor recognizes Vlachos' pioneering work on multiscale modeling and application to development, design and interpretation of catalytic reaction mechanisms, rational materials design and renewable energy.

Vlachos will receive the award at the AIChE annual meeting in October. Michael Klein, Dan Rich Chaired Professor of Chemical Engineering and director of the UD Energy Institute, received the Wilhelm Award in 2008.



**RICHARD P. WOOL**, a professor in the Department of Chemical Engineering and director of UD's Affordable Composites

Research (ACRES) program, received the 2011 American Chemical Society (ACS) award for Affordable Green Chemistry.

The annual award recognizes scientific discovery of new eco-friendly chemistries with the potential to enable products or manufacturing processes that are less expensive than existing alternatives.

Wool's research centers on the use of soybean oil and chicken feathers in new bio-based composite materials, including computer circuit boards and hurricane-resistant roofs. Wool is using the bio-based materials in support of several renewable energy projects, such as wind, solar, hydrogen storage and energy efficient housing, as practical solutions to global warming. His research was highlighted during the conference at a symposium held in his honor during the society's 241st national meeting in Anaheim, Calif., on March 29, 2011. His work through the ACRES program was also featured on MSNBC, *The Dylan Ratigan Show*, and the Public Broadcasting Service series *NOVA's Making Stuff: Stronger, Smaller, Cleaner, Smarter*.

## Four UDRF awards to chemical engineering

The University of Delaware Research Foundation (UDRF) has awarded strategic initiative grants to nine UD faculty teams for research on topics ranging from Alzheimer's disease to advanced composites for generating hydrogen.

In addition to advancing the University's strategic plan, major goals of the program are to pair early-career faculty with senior faculty mentors and to seed promising research that will lead to larger proposals to such agencies as the National Institutes of Health and the National Science Foundation, according to Mark Barteau, UD's senior vice provost for research and strategic initiatives.

The Research Office administers the program. Each award of \$45,000 supports a one-year research project. The funding includes \$35,000 provided by UDRF, which is matched by \$5,000 from the provost and \$5,000 by the researcher's college dean.

Four funded projects that include the chemical engineering faculty are:

### Determinants of Tau Protein Aggregation, a Key Player in Alzheimer's Disease

**DAVID COLBY**, assistant professor, and **ANNE ROBINSON**, professor, are working to determine what causes tau protein, found in abundance in the long, slender axons, or signal transmitters, of normal nerve cells, to misfold and tangle, ultimately leading to nerve cell death.

### Nanoparticle Stabilization of Co-Continuous Polymer Blends for Organic Photovoltaics

**THOMAS H. EPPS, III**, assistant professor, and **ERIC M. FURST**, associate professor, are using formulations of tiny particles of titanium dioxide and semi-conducting polymers to generate new organic electronics membranes with improved performance and efficiency due to the formation of stable, continuous electron-conducting pathways.

### DNA-Modified Collagen Scaffolds for Improving Acute Wound Repair

**MILLCENT SULLIVAN**, assistant professor of chemical engineering, and **KRISTI KIICK**, associate professor of materials science and engineering, are combining their expertise in gene delivery and materials design to develop biomaterials with the controlled release of growth factor for improving wound care. Approximately 50 million surgical procedures and an additional 50 million traumatic wounds occur annually in the United States.

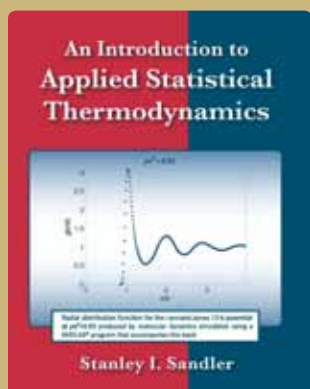
### Novel Nanoporous Cathode Material for Lithium-ion Batteries

**FENG JIAO**, assistant professor, is working to develop novel cathode materials to boost the energy storage of lithium-ion batteries, which are used in items ranging from laptops to electric cars. He is exploring a new synthetic method, ionothermal synthesis, for preparing lithium manganese phosphates with 3D nanoporous structures. The material's porosity would enable the removal and re-insertion of lithium ions from/into the 3D channels at high current density.

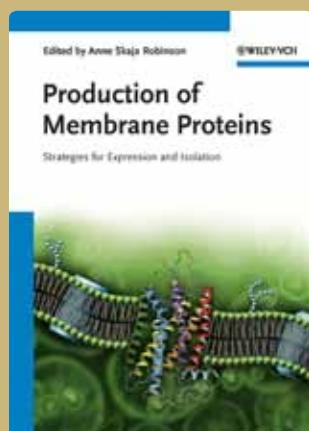
**ANTONY BERIS** recently lectured to students from St. Andrew's School on the forces that dominate fluid flow under two different situations: high viscosity fluids like honey flowing from a jar and low viscosity air passing by the wing of an airplane. The students were on campus in an effort help them understand mathematical and engineering principals used in research laboratories.

# Published

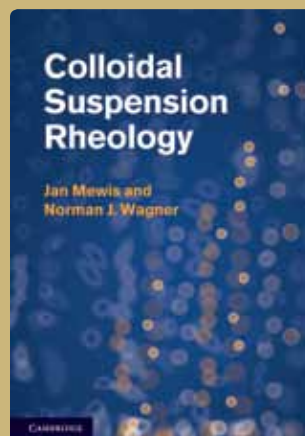
Books, Monographs, and Journal Articles that were highlighted on covers selected from over 120 publications by our faculty this past year.



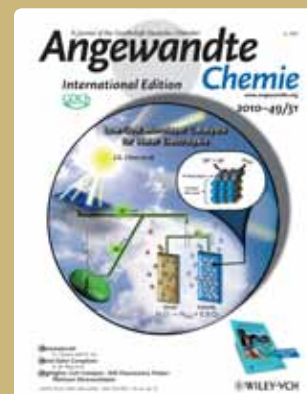
An Introduction to Applied Statistical Thermodynamics, John Wiley and Sons by Stanley I. Sandler



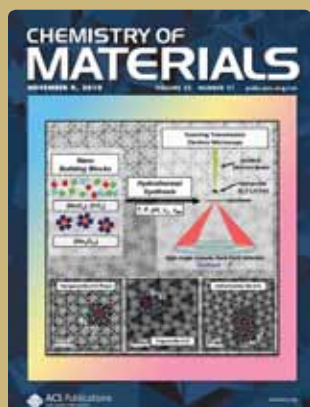
Edited by Anne Skaja Robinson



Colloid Suspension Rheology, Cambridge University Press by Jan Mewis and Norman Wagner



"Low-Cost Hydrogen-Evolution Catalysts Based on Monolayer Platinum on Tungsten Monocarbide Substrates" By Dr. Jingguang Chen, Dr. Robert Birkmire, Daniel Esposito, Sean Hunt, Alan Stottlemeyer, Dr. Kevin Dobson, and Brian McCandless



"Atomic-Scale Investigation of Two-Component MoVO Complex Oxide Catalysts Using Aberration-Corrected High-Angle Annular Dark Field Imaging" By: Doug Buttrey, William Pyrz, Douglas A. Blom, Masahiro Sadakane, Katsunori Kodato, Wataru Ueda, Thomas Vogt



A Special Tribute to Stan Sandler: The Reach and Impact of a Life-Long Dedication to the Chemical Engineering Profession



"Detecting RNA viruses in living mammalian cells by fluorescence microscopy" By: Divya Sivaraman, Payal Biswas, Lakshmi N. Cella, Marylynn V. Yates and Wilfred Chen





## Thomas H. Epps, III receives DuPont Young Professor grant

**THOMAS H. EPPS, III**, professor of Chemical Engineering, was one of 12 young professors from universities in the United States and China recognized by DuPont to receive the DuPont Young Professor grant for original research.

This innovative grant program, which began in 1967, is designed to provide unrestricted start-up assistance to promising young and untenured research faculty working in areas of interest to DuPont's long-term business. Epps will receive a \$75,000 grant, given in \$25,000 increments over three years. The grant may be used to obtain matching funds through the National Science Foundation or other organizations.

Epps' current research focuses on surface and interfacial interactions in nanostructured polymeric systems. Epps was named Outstanding Junior Faculty in the College of Engineering and was awarded a Department of Defense Presidential Early Career Award for Scientists and Engineers (PECASE) in 2009. He received his doctorate in chemical engineering from the University of Minnesota in 2004, following undergraduate work at the Massachusetts Institute of Technology (MIT).

## BioGENEius Challenge

State, DBI recognize Delaware BioGENEius Challenge winners

Delaware Gov. Jack Markell joined **KELVIN LEE**, director of the Delaware Biotechnology Institute (DBI), during a ceremony Tuesday, May 31, to recognize three winners from the Delaware BioGENEius Challenge, a competition for high school students who demonstrate an exemplary understanding of biotechnology through science research projects.

Delaware BioGENEius Challenge finalists were chosen from the March 7 Sussex County Science Fair and March 10 New Castle County Science Expo. Delaware's finalists include Priyen Patel, 16, of Sussex Technical High School, and Achille Tenkiang, 15, and Jaewoong Yoo, 17, of the Charter School of Wilmington.

"Innovation is part of Delaware's DNA," Markell said. "We have made supporting science, technology, engineering and math education a priority because of those subjects' critical role in the health and welfare of our economy and our citizens. As a nation, we need to own molecular innovation this century as thoroughly as we led in mechanical innovation in the last. Priyen, Achille and Jaewoong are showing that we can."

The three Delaware finalists will advance to the U.S. National BioGENEius Challenge on June 25 in Washington, D.C. Ten national finalists will then compete at the International BioGENEius Challenge, which will be held June 27 in conjunction with the 2011 Biotechnology Industry Organization (BIO) International Convention. Judges will select the top four winners from 14 U.S. national, Western Australia, and Canadian finalists. The first place winner of the International Challenge will receive \$7,500; second place will receive \$5,000; third place will receive \$2,500 and fourth place will receive \$1,000. Each remaining participant will receive an honorable mention award and \$500.

The Delaware BioGENEius Challenge is sponsored by contributions from AstraZeneca and from DBI faculty and staff.



*Pictured at the BioGENEius Challenge presentation are, from left, Tyrone Jones of AstraZeneca, State Rep. David Wilson, Lt. Gov. Matt Denn, DBI Director Kelvin Lee, student winner Priyen Patel, student winner Jaewoong Yoo, Gov. Jack Markell, student winner Achille Tenkiang, State Rep. William Outten and student Bansri Patel, who earned honorable mention.*

## Joey Kim named Goldwater Scholar



University of Delaware student Joey D. Kim, a chemical engineering major—has been awarded a scholarship by the Barry M. Goldwater Scholarship and Excellence in Education Foundation.

The scholarship program honors the late U.S. senator

and was established to provide a continuing source of highly qualified scientists, mathematicians and engineers by awarding scholarships to college students who intend to pursue careers in these fields. The premier undergraduate award of its type in these fields, it covers the cost of tuition, fees, books and room and board up to \$7,500 per year.

To Kim, who is from Irvine, Calif., being named a Goldwater Scholar “is a representation of the first major step toward achieving my career goals.” He plans to earn a doctorate in renewable energy and become a research professor at a university “to have direct impact on both the future generation of engineers and the world of science.”

He particularly thanked Thomas H. Epps, III, assistant professor of chemical engineering, “for providing me with an opportunity to engage in research as a part of the Epps group, as well as funding my project.”

He said he also was grateful for help he received from Julie N.L. Albert, his graduate student mentor; Sue Serra, coordinator of the Office of Service Learning; John Burmeister, Alumni Distinguished Professor of Chemistry and Biochemistry; and Daniel Cha, professor of civil and environmental engineering.

**TEJAL NAIK**, a senior in Chemical Engineering has won the ASBMB 2010 Thematic Best Poster at the American Society for Biochemistry and Molecular Biology’s Annual Meeting in Anaheim.



## Fellowships in the fast lane—6 NSF fellowships to ChE students

Six chemical engineering students are the latest in the UD family who can say they have something in common with a number of Nobel laureates, Google’s founder, Sergey Brin, and U.S. Secretary of Energy Steven Chu. They are all winners of the National Science Foundation’s Graduate Research Fellowship.

“It is a great honor to be recognized,” says graduate student **BENJAMIN KREMKOW**. “I have been fortunate with the opportunities that have been provided to me, as well as the professors who

have helped make me into the student researcher I am today.”

Kremkow is one of three NSF Fellows who now will pursue doctoral research in chemical engineering at UD. He is joined by **BRYAN YONEMOTO**, also currently a graduate student in chemical engineering at UD, and **MARIAH WOODRUFF**, who is completing her master’s degree at North Carolina State University and will begin studies at UD this fall.

Three UD seniors in chemical engineering won fellowships and will continue their research at other institutions. They include **MARK WEIDMAN**, who will attend the University of California-Santa Barbara; **AMY CHEVALIER**, the University of Virginia; and **SEAN HUNT**, the University of Wisconsin-Madison.

# STUDENTS

## NSF Singapore Fellow

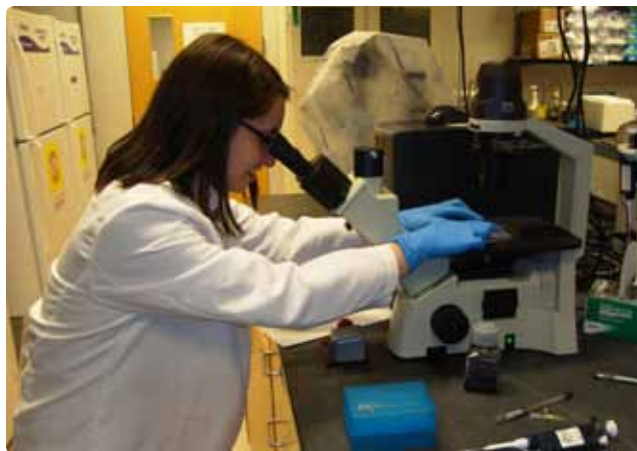
**MELISSA ST. AMAND** (pictured), a third-year doctoral candidate in Chemical Engineering, was selected as a 2011 National Science Foundation East Asia and Pacific Summer Institutes (EAPSI) fellow. Only 15 students nation-wide and across all scientific disciplines are selected for the Singapore program.

She spent the summer at the National University of Singapore learning methods to characterize protein glycosylation as part of her thesis research, which looks at improving the quality control strategies in the biopharmaceutical industry. Currently, quality assurance in this industry is done offline and innovations toward an online quality control would improve product quality and safety, and reduce production costs.

The primary goals of EAPSI are to introduce U.S. students to East Asia and Pacific science and engineering in a research setting and to help students initiate scientific relationships that will enhance future collaborations with their foreign counterparts. The program provides students research experiences, an introduction to the scientific policy and infrastructure of a foreign location and an orientation to the society, culture and language of that location.

St. Amand is co-advised by Babatunde A. Ogunnaike, interim dean of engineering and William L. Friend Chaired Professor of Chemical Engineering and Anne S. Robinson, professor of chemical engineering.

"I am the first generation in my extended family to go to college, so to be given an opportunity like this is truly a dream come true. This invaluable experience will expand my experimental capabilities through access to state-of-the-art technology and intellectual discussions with those working on research problems similar to my own," St. Amand said.



**JOSEPH STANZIONE**, a doctoral student in chemical engineering, has documented new evidence supporting Professor Richard P. Wool's Twinkling Fractal Theory (TFT).

TFT is a conceptual approach to understanding the nature and structure of the glass transition in amorphous materials. Developed in 2008, the theory provides a quantitative way of describing the process by which glassy materials transform from a molten state to a solid. The phenomenon was previously explained from a strictly empirical perspective.

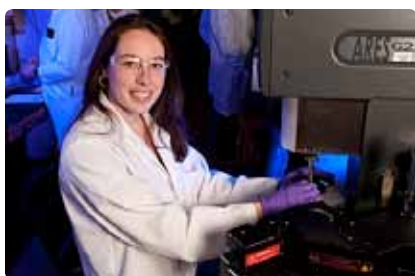
"Glass transition in amorphous materials remains a major unsolved problem in solid-state physics," said Stanzone, who is advised by Wool.

Stanzone presented his experimental findings during the Excellence in Graduate Polymer Research Symposium, held March 28 as part of the American Chemical Society's national meeting in Anaheim, Calif. He also received the 2011 POLY Division Excellence in Graduate Polymer Science award at the conference for his original work.

## Space suit safety

NASA Fellowship opens doors for chemical engineering student's research

Kate Gurnon, a doctoral student in the Department of Chemical Engineering, has received a NASA Delaware Space Grant fellowship to study materials that show promise to improve micrometeoroid orbital debris (MMOD) resistance in the next generation of space suits.



MMOD are sub-centimeter sized particles can travel up to 19 kilometers per second and have the potential to penetrate space

suits, placing astronauts working outside the aircraft at risk and sometimes forcing them to abort their mission.

The one-year, \$26,000 grant will fund Gurnon's research on Shear Thickening Fluids (STFs), a novel nanotechnology with the potential to make nanoparticles in a carrier fluid become stiff and dissipate energy, creating a protective layer on select materials. When incorporated into ballistic textiles, such as Kevlar, STF nanocomposites demonstrate increased ballistic protection and puncture resistance.

Gurnon is advised by Norman J. Wagner, Alvin B. and Julia O. Stiles Professor of Chemical Engineering and department chair, and John W. (Jack) Gillespie, Jr., Donald C. Phillips Professor and director of UD's Center for Composite Materials.

Her research focuses on a new approach to dynamic materials testing, Large Amplitude Oscillatory Shear (LAOS), which will enable her to develop rheological equations that describe the stress state of STFs under dynamic loading.

"Nanocomposite material performance research is a complicated, yet crucial

element in engineering STFs for spacesuit applications," explained Wagner. "Kate must consider not only impact loads and deformation fields, but also how STF composition and microstructure will perform in space."

If successful, her work could lead to more durable, penetration resistant materials for space suits. Gurnon said she hopes the fellowship will also help her become a scientific leader in nanomaterial design and applications, and a role model for future female engineers.

"By disseminating knowledge of the potential advantages of STF technology to a broad audience, I have the opportunity to influence other young women, like myself, to pursue a career in science and technology," she said.

Also this year, Gurnon won third place in the graduate student poster competition at the Society of Rheology's 82nd annual meeting. Her poster, entitled Rheo-Physics of Shear Thickening Fluids during Large Amplitude Oscillatory Shear (LAOS), was selected from among 100 submissions.

## UD students excel at UMBC undergraduate research symposium

Three chemical engineering undergraduate students participated in the 13<sup>th</sup> annual Undergraduate Research Symposium in the Chemical

and Biological Sciences at the University of Maryland, Baltimore County, on Oct. 30, 2010:

- **AMY CHEVALIER**, "Trafficking patterns of adenosine A2A receptor," Chemical Engineering. Advised by Anne Robinson.
- **CHET MARKWALTER**, "Elucidating mechanisms of heterologous neurokinin 2 receptor expression and trafficking in *S. cerevisiae*," Chemical Engineering. Advised by Anne Robinson.

- **TEJAL NAIK**, "Development of a peptide nucleic acid based siRNA delivery system," 2nd place, Biochemistry Group 2N. Advised by Millicent Sullivan.

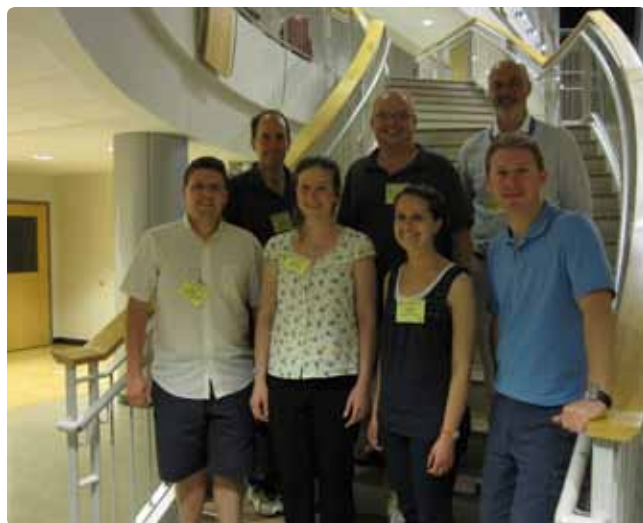
Supported by the National Institutes of Health (NIH), the research conference was devoted entirely to contributions from undergraduates from universities and colleges across the Mid-Atlantic region. Students presented the results of their work in chemistry, biology and at the chemistry-biology interface in poster sessions.



## Summer Institute helps doctoral students plan for academic careers

**DANIELLE HANSGEN** in chemical engineering was one of seven highly motivated doctoral students from a range of disciplines that participated in the Putting Your Ph.D. to Work: 2010 Academic Career Preparation Summer Institute, co-sponsored by UD's Office of Graduate and Professional Education, the Center for Teaching and Learning and the Bank of America Career Services Center. The institute focused on the dual goals of preparing students for the academic job search and successful transition into the first year of an academic appointment. "The institute has given me the confidence to be a successful candidate. Learning about CVs and the other documents doesn't take place in any academic course," Hansgen noted. "It was really nice having a group of peers to share with, who were going through the same process I was."

**ELIZABETH KELLEY**, a chemical engineering graduate student, received the graduate student/post-doctoral poster award at the Polymers Gordon Research Conference for her work on the synthesis of polymer-peptide conjugates for targeted drug delivery applications. Kelley was one of nine student speakers June 12-17 at the Polymers Gordon Research Seminar held in conjunction with the conference, where young researchers annually gather to discuss cutting-edge research and advances in polymer synthesis, physical characterization and technological performance. Kelley is advised by assistant professors of chemical engineering, Thomas H. Epps, III, and Millicent M. Sullivan.



## Alternative Energy Research



**THOMAS KELLY**, a third-year doctoral candidate in the Chemical Engineering, has been awarded the Air Products Graduate Fellowship for the 2010-2011 academic year. Kelly is advised by Jingguang G. Chen, Claire D. LeClaire Professor of Chemical Engineering.

Kelly is studying alternative energy sources that will advance the movement from fuels based on oil and gas toward biorenewable energy sources. In specific, his research focuses on alternative electrocatalysts for direct alcohol fuel cells.

Alcohols are an attractive fuel source, said Kelly, because they are liquid at room temperature and miscible with water. Chen explained, however, that one of the technical hurdles of proton exchange membrane fuel cells is that the current electrocatalysts are made of platinum-group metals that are very expensive and are easily poisoned by carbon monoxide.

"Tom's research involves discovering alternative materials that are less expensive and more poison-tolerant than platinum-group metals," said Chen.

Kelly's research builds on previous work done by Chen's group with methanol, and extends to higher alcohols such as ethanol and butanol. These higher alcohols are more attractive than methanol because they are less toxic and more easily produced from biomass.

The fellowship is supported through an annual gift to the University by the Air Products Foundation.

"Air Products is helping to educate the next generation of engineers who will help solve the world's demand for clean, affordable energy by providing this unique graduate fellowship that is coupled with an industrial research internship," said Norman Wagner, the Alvin B. and Julia O. Stiles Professor of Chemical Engineering and chairperson of the department. "We appreciate the dedicated and loyal alumni there who helped create this new graduate fellowship and continue to support it."

# Research

**JINGGUANG G. CHEN**, Claire D. LeClaire Professor in Chemical Engineering, has co-authored a paper demonstrating a new way to save platinum commonly used as a catalyst in hydrogen production.

Chen's paper, entitled "Low-Cost Hydrogen Evolution Catalysts Based on Monolayer Platinum on Tungsten Monocarbide (WC) Substrates," appeared as the cover feature in a December 2010 issue of *Angewandte Chemie International Edition*, the leading high impact journal in the world on applied chemistry.

Chen explains that when powered by renewable energy sources such as wind—or solar-based technologies, the generation of hydrogen from the electrolysis of water produces a high-energy-density mobile energy carrier without any associated carbon dioxide emissions. At low temperatures, this water-splitting process can take place in a variety of electrochemical devices, however, the catalyst used to initiate the hydrogen-evolution reaction (HER) can have a profound influence on cost, lifetime and efficiency of the device.

Co-authors of the paper include Robert W. Birkmire, professor of materials science and engineering and director of the Institute of Energy Conversion (IEC); Kevin D. Dobson, IEC research associate; students Daniel V. Esposito, Sean T. Hunt and Alan L. Stottlemeyer; and Brian E. McCandless, IEC associate scientist.

**ANNE ROBINSON**, professor in the Department of Chemical Engineering, won the 2010 Addgene's Recombinant DNA (rDNA) Technology Award for innovation in plasmid design. The award recognized laboratories developing new DNA-based technologies to address important biomedical questions, according to a press release distributed by Addgene. Winners were chosen based on the innovation and the ability to address research barriers in their field, as well as the technology's impact on the research community.

Robinson's group is designing new methods for heterologous protein expression in yeast using G-Protein Coupled Receptors (GPCRs), a family of membrane proteins proven to be excellent targets for drug design. Carissa Young and Zack Britton are the graduate students leading this project. Young is using live-cell imaging techniques to capture high quality microscopic images of yeast cells. She says that collaborating with the Delaware Biotechnology Institute's (DBI) Bioimaging Center under the guidance of Kirk Czymmek, associate professor in the Department of Biological Sciences, has allowed the team to experimentally address the localization of GPCRs in cells by using correlative microscopy.

"Incorporating correlative techniques, a combination of confocal microscopy and transmission electron microscopy (TEM), we can compare, on a cell-to-cell basis, the similarities and differences between protein distributions, based on fluorescence, to the actual dimensions of specific organelles," explains Young.

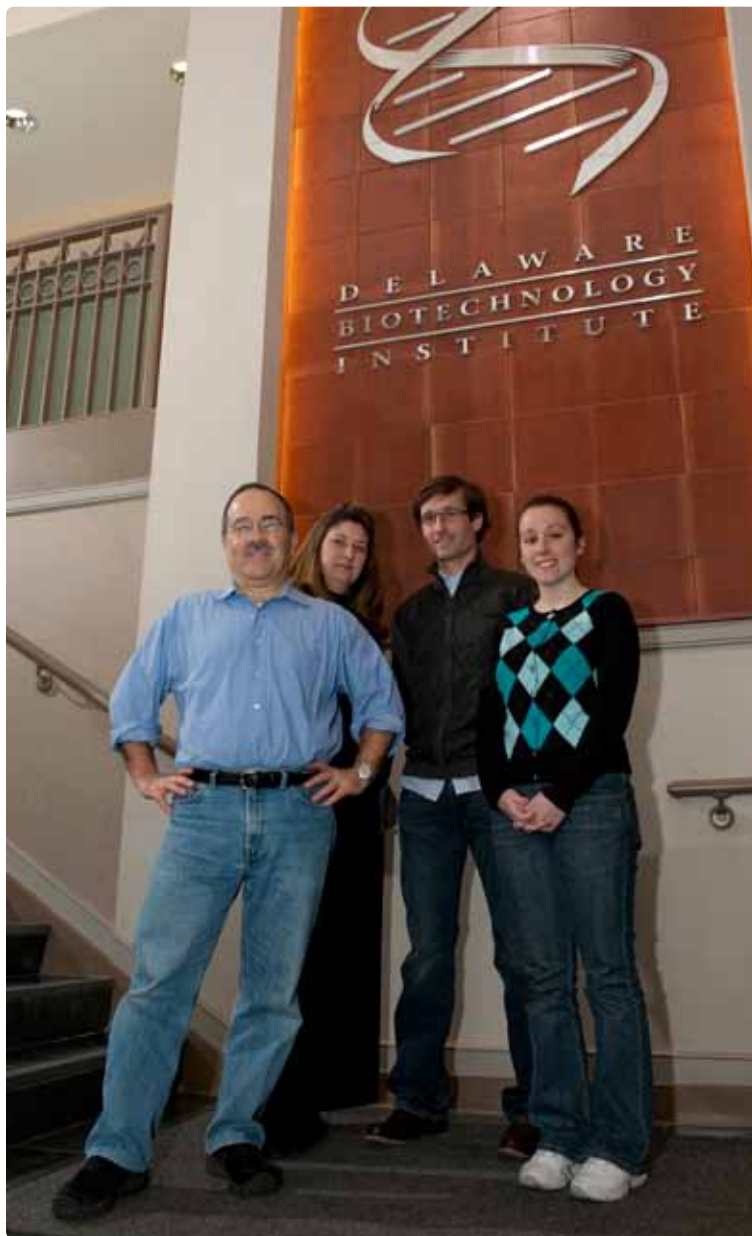
## COBRE grant renewed

The National Institutes of Health (NIH) has awarded the University of Delaware a five-year, \$5.7 million grant for continued study of membrane protein production and characterization, an important area of biomolecular research. The current renewal marks UD's 11th year on

the interdisciplinary grant, which is funded through the NIH Center of Biomedical Research Excellence (COBRE) program. **ABRAHAM M. LENHOFF**, Allan P. Colburn Professor of Chemical Engineering, is principal investigator for the grant. The scope of the research is broad and covers

a spectrum from membrane protein overexpression, solubilization and purification, to structure-function studies based on crystallographic characterization, to predominantly functional studies of biomedically significant or related membrane proteins.

# RESEARCH



## Translating knowledge to practice

Imagine being able to create an ideal organism for producing biofuels and chemicals from renewable resources: resistant to toxic chemicals, a fast grower and producer, complete with only desired, beneficial bioprocessing characteristics.

While it sounds almost too good to be true, **ELEFTHERIOS (TERRY) PAPOUTSAKIS**, Eugene du Pont Chair of Chemical Engineering at UD, filed two invention disclosures in 2010 that put him at the forefront of this uncharted research field.

He is among a growing number of UD researchers who are working to protect and commercialize their ideas through the University of Delaware Office of Economic Innovation and Partnerships (OEIP) Technology Transfer Center.

The process is open to the entire University; anyone from an undergraduate student to a tenured faculty member can disclose an invention, regardless of its stage of development.

OEIP files a provisional patent on the inventor's behalf, giving the inventor one year to develop and realize the idea's commercial potential. During that year, OEIP works closely with the inventor, providing advice and counsel.

In fiscal year 2010, OEIP filed 56 invention disclosures, the first step in the patenting process. Ten of these came from chemical engineering.

*Adapted from a story by Meredith Chapman*

# Alumni Coordinator Remarks by Jon Olson

I have been asked by a number of alums about the impact of the current recession on job placements for undergraduates. There is a national perception that finding or keeping a job is much harder for the middle class, and one would expect the effects of the recession to hit the hiring of our seniors.

The department collects data for job offers before graduation as part of a long-standing participation with college placement efforts nationwide. Our data, although necessarily from small samples, shows some trends:

YEAR	PERCENT				ANNUAL SALARIES	
	HIRED	GRAD SCHOOL	SEEKING	NO INFO	\$	K
2011	26	22	52	0	65	75
2010	33	43*	21	3	66	85
2009	46	23	31	0	63	92
2008	64	18	18	0	60	79

*\*2010 was very small; number going to grad school was normal*

In the last four years the percentage of seniors gaining industrial employment before graduation (percent hired) has fallen well beyond the expected declines. The academically advantaged students have elected to go to graduate school (percent GS, normally about 20%), and the remainder (percent seeking) enter the job market after graduation, now a very difficult ordeal. The average starting salaries had been growing slowly in the last decade but now are, at best, level. The highest starting salary is often markedly above the average, but this year the trend for an exceptional difference is broken.

So to answer the alum's question, the hiring premium chemical engineers previously commanded in the job market has diminished, mostly from lack of demand. Salaries have stayed stable for the moment but are expected to decrease as public and private sectors pay less because they can.

Our faculty pride themselves on their interaction with students, and the top of the class does extraordinarily well in winning major awards. Our interaction with recruiters remains strong with select companies, but this list needs to grow in order to respond changes in the job market.

Networking is a cliché, but it's real. If you or your company are hiring—don't forget our talented students when looking to fill your company needs.

## Alumni Weekend Review

President Patrick Harker has made UD reunions a major occasion. This year was the third Alumni Weekend event of the Harker era, the intent of which is to foster a strong sense of belonging to the institution. Alumni support really depends on the lasting friendships made at UD.

At the 2011 reunion I was asked by John Supancic, B61, to attend a luncheon with 7/17 of his classmates. Their conversations showed general admiration for "Cactus" Jack Gerster and Bob Pigford, and a general "respect" for thermo taught by Art Metzner. Those who went to graduate school found the adjustment relatively easy ("well prepared", "went over the same things we had as UGs"), and that admission depended on no more than a phone call from Gerster or Pigford to the right person at the other end. This was a group of bright guys who enjoyed successful careers. It was great fun to be there.



During Reunions Monica Gallagher and Dan Sarkissian of Development arranged a dinner for five 1985 chemical engineering classmates, **MONICA GALLAGHER, CHUCK HERAK, LISA LAFFEND, BLAIR SOUDER** and **ROB TULLMAN**. Fraser Russell and I joined them before dinner to celebrate a generous donation by Rob in support of a new classroom in the Interdisciplinary Science and Engineering laboratory (ISE-lab). When Fraser emphasized the importance of industrial experience for undergraduates, Rob graciously offered four industrial summer internships for students.

Monica previously worked with Hoechst, then Aventis Pharma as a rep, and now runs Affinity Logo LLC from her home.

Chuck is the VP and general manager of J.M. Huber, a specialty company that sells silicas and silicates. He earned a DSc at MIT after graduation, worked in engineering for three years, earned an MBA and had a business career with Hercules before joining Huber. Lisa earned her Ph.D. at Cornell and has been at DuPont in Central Research where her major focus has been on 1,3 propane diol, a polymer intermediate. Blair's career has been with United technologies, GE Plastics, Victrex PLC as a commercial director. He is now with Entheos Partners, and executive coaching organization. Rob's career started with Nalco, move to electric utilities, and then to Granite Services, which is now a GE affiliate. Granite builds and services wind power generators.

While there are many promotion announcements in the alumni notes that follow, I highlight three here for your consideration: **JAMES OWENS, B86**, was made president of H.B. Fuller after successfully directing the firm's major branch for three years; **PETER VEVERKA, B 88**, has been hired by Finch Paper for his expertise in paper coatings: particularly his papers analyzing



coating instability; and **SUJATA BHATIA, B 99, M 99, MD/ PH.D. PENN 93**, was recently appointed to a faculty position at Harvard.

Finally, **JACK WEIKART**, age 92, has continued in his retirement to contribute to this column through his masterful ability to read material closely and identify UD chemical engineering graduates. All of us thank him for these efforts.



—Jon Olson

P.S. I welcome alumni news, about yourself or other UD chemical engineering friends, Please email updates to [olson@udel.edu](mailto:olson@udel.edu).

# Alumni News Briefs

**KEVIN BRACKEN, B 1970**, was appointed vice president of Manufacturing at Verenum Corporation. Verenum produces high-performance industrial enzyme solutions. Bracken leaves Vical Incorporated as their vice president of Manufacturing to join Verenum. Bracken received his bachelor's degree in chemical engineering from the UD and his master's degree in chemical engineering from University of Rochester.

**JOHN P. ANEROUSIS, B 1971**, was named chief business development officer of Coastal Flow Gas Measurement, where his primary duties will include advancing Coastal Flow's BirdDog Remote Data Retrieval System, marketing and business development. Anerousis holds bachelor's degrees in Chemical Engineering and Chemical Engineering Administration from UD.

**J. ERIK FYRWALD, B 1981**, chairman, president and CEO of Nalco Co. and a UD alumnus, emphasized the role his company plays in global water dynamics during a presentation, "Nalco: Model of Profitable Growth in Green Technology—Growth in China and India," Feb. 19, at UD's Goodstay Center in Wilmington.

"There is a real and significant shortage of clean water in much of the world today," began Fyrwald, "and the problem is getting worse because the demand for water is growing at two times the rate of the growth of the population. In fact, over one billion people in the world don't have enough clean water for their needs and about five million children die each year due to lack of available, clean water."

Citing industry as a key player with the ability to impact global water dynamics, Fyrwald explained Nalco's purpose is to work with a variety of industrial customers—including manufacturing facilities, universities, hospitals and other large buildings—that use water to either cool or heat as part of their operating processes, and help them to reduce

consumption and improve productivity while boosting the bottom line.

"Our sole focus is to help customers operate their water systems better," he said, "by using Nalco's approximately 7,000 service technicians worldwide, automation technology, specialty equipment, and chemistry as a package, resulting in lowering water use by roughly 25 percent and increasing energy efficiency by about 15 percent."

Before joining Nalco, Fyrwald held a 27-year career at DuPont. From 2003 to 2008, he served as group vice president of the agriculture and nutrition division of DuPont. From 2000 until 2003 he was vice president and general manager of DuPont's nutrition and health business.

**PETER J. VEVERKA, B 1981**, was appointed as senior product development engineer in Finch Papers product development division. Veverka joined Finch Paper after 15 years with International Paper. He holds several patents and is a published scholar. Veverka earned his bachelor's degree in chemical engineering from UD and holds both a master's degree and doctorate in Pulp and Paper Engineering from IPST at Georgia Tech. He also studied at a master's level in Process Control and Production Management in the Paper and Pulp Industry from Helsinki University of Technology.

**GEORGE MAHAFFEY, B 1981**, was announced as president and CEO of Lithera, Inc., where he will also serve on the Board of Directors. Mahaffey has worked in the pharmaceutical and biotechnology industry for 24 years, most recently as CEO of Peplin. Mahaffey earned his bachelor degree in chemical engineering from UD and an MBA from the University of South Florida.

**DAVID MEISTER, B 1984**, was appointed the director of enforcement at Commodity Future Trading Commission.

Meister is a former federal prosecutor with experience in investigations, litigation and trials concerning the United States financial markets. He received his bachelor's degree in chemical engineering from UD and obtained his law degree from Columbia University.

**RONALD G. KANDER, PH.D. 1988**, has been named executive dean in the newly created College of Design, Engineering and Commerce at Philadelphia University. Kander was previously the director of the School of Engineering at James Madison University. The new college, which opens fall 2011, combines the fields of design, engineering and business. Kander received his bachelor's degree in chemical engineering from Carnegie Mellon University, and a doctoral degree in chemical engineering from UD.

**ANNE ROBY, PH.D. 1993**, has been appointed president of Praxair Asia. In this position, Roby will be responsible for China, India, South Korea and Thailand's growth and profitability of Praxair's industrial gases business. He continues his current role as president of Praxair Electronics in Asia, Europe and North America. Roby earned a bachelor's degree from Villanova University and a doctorate in chemical engineering from UD.

**CAROLYN JACKSON, B 1996**, was named chief executive officer at St. Christopher's Hospital for Children. Jackson was previously the chief operating officer and then chief executive officer at Tenet's Lake Pointe Health Network in Texas. She received her bachelor's degree in chemical engineering from the UD and her MBA from Harvard.

*(continued)*

## Transforming TB care

In 1996, UD alumnus **TOM GUTSHALL (B 60)** pioneered Cepheid, a diagnostics company in Sunnyvale, California, that designs and manufactures sophisticated devices to detect infectious disease and cancer using DNA analysis.

Previously known for developing diagnostics products used in hospitals and by the Postal Service to screen mail for anthrax, today Cepheid is at the center of efforts to rapidly diagnose tuberculosis (TB). The company recently unveiled a test that can diagnose TB in about 100 minutes, far less than traditional testing which can take up to three months for results.

"This test shifts the paradigm dramatically in that patients coming from remote areas of a country can be evaluated, tested and diagnosed while they are with their physician, breaking the cycle of patients disappearing back into their communities before treatment can be administered. If we can implement this test worldwide, we will finally get our arms around TB," said Gutshall.

According to the World Health Organization (WHO) estimates, TB affected 9.4 million people worldwide in 2009, killing 1.7 million. It is particularly prevalent in developing regions of Africa, India and China.

Cepheid developed the 'while-you-wait' test in 2006, with partial funding from the Foundation for Innovative and New Diagnostics (FIND), a non-profit group supported by Bill and Melinda Gates. Called Xpert MTB/RIF, the test is simple and involves mainly a nasal or throat swab, sometimes a blood specimen. It can be performed outside regular laboratories, an advantage in developing countries, and it is expected to be made available in all countries.

Announced in the New England Journal of Medicine in Sept. 2010 and endorsed by WHO a few months later, Gutshall admits the discovery does raise other concerns. Among them are the escalating costs of treatment.

"The cost of delay is much worse than the cost of discovery," he said. "When you find and treat the disease, the ultimate cost downstream is less because as you treat, that communicable disease is not passed to more people."

Cepheid is now working to create a rapid HIV test, since TB exists concomitantly in countries with HIV. By late 2012 Cepheid hopes to offer "the companion AIDS test" that will simultaneously diagnose TB and HIV on the same platform, whether the patient is in the jungle in Nairobi, Africa, or the Mayo Clinic in Scottsdale, Arizona.



Gutshall received his bachelor's degree in chemical engineering in 1960. A longstanding member of the chemical engineering advisory council, he and his wife, Kipp, have been very active with the University and the Chemical Engineering department over many years.

In 2010, he served as co-chair of his 50th class reunion giving program, further demonstrating the Gutshall's constant and enthusiastic advocacy and support for the department. The Dean of Engineering's Conference Room (in New DuPont Hall) is named in their honor, and Tom is a supporter of the chemical engineering program.

# Alumni News Briefs

(continued)

**DANIEL SHANTZ, PH.D. 2000**, was appointed the Ray Nesbitt Development Professorship III in Chemical Engineering at Texas A&M University. Previously, Shantz was an associate professor in the Artie McFerrin Department of Chemical Engineering; he is also the associate head for undergraduate programs. He earned his undergraduate degree at the University of Florida and his Ph.D. at UD.

**WIM THIELEMANS, PH.D. 2004**, was selected for an International Communication Fellowship by Environmental Health Sciences. The goal of the fellowship will be to produce research papers in basic terms that allow for engaging discussion. Thielemans received his Ph.D. from UD.

**ASHISH MHADESHWAR, PH.D. 2005**, has been hired as an assistant professor in the Department of Chemical, Materials and Biomolecular Engineering at the University of Connecticut. He goes to UCONN from GE Global Research Center as a Senior Research Engineer. While at GE he focused on emissions related projects, including emissions reduction and emissions after-treatment for locomotives and turbines. Mhadeshwar received his Ph.D. in chemical engineering and continued as a post-doctoral researcher at UD.

**MARK A. SNYDER, PH.D. 2006**, was the recipient of CAST's 2010 W. David Smith Jr. Graduation Publication Award for his piece entitled "Mesoscopic Modeling of Transport and Reaction in Microporous Crystalline Membranes." This paper was published in Chemical Engineering Science. Snyder earned his Ph.D. at UD in 2006.

**MATT HELGESON, PH.D. 2009** (*pictured*), a recent Ph.D. grad, received the 2010 Victor K. LaMer Award at the ACS Colloids and Surface Science Symposium in Montreal in June. This award is given annually to the best doctoral thesis in the field awarded within the last three years in the USA and Canada. He was advised by Prof. Norman Wagner and Prof. Eric Kaler of the Department of Chemical Engineering. *The images are of Matt receiving the award from Prof. Michael Bevan, Chair of the awards committee and standing with Prof. Wagner.*

Helgeson earned his Ph.D. in chemical engineering at UD in 2009. He is currently doing his postdoc at the Massachusetts Institute of Technology. He has accepted an assistant professor position at University of California, Santa Barbara, beginning March 2012.

**MICHELLE O'MALLEY, PH.D. 2009**, has accepted an assistant professor position at University of California, Santa Barbara. O'Malley received her Ph.D. in chemical engineering from UD in 2009. She is currently conducting postdoctoral research at MIT and will start her new position in March 2012.





## Donated pilot plant directs student learning toward entrepreneurship

Beginning fall 2011, chemical engineering students will be educated in biodiesel production and design processes through the department's senior laboratory course, led by Antony Beris, the Arthur Metzner Professor of Chemical Engineering. The opportunity is the result of a generous gift from UD alumnus **JAMES SEFERIS, PH.D. '77**, who donated a biodiesel processor to the department last spring.



House in Colburn Laboratory, the biodiesel processor (worth an estimated \$50k) is capable of recycling 130-150 gallons of cooking oil per batch to produce 100 gallons of biodiesel fuel, as well as glycerin, a syrupy by-product with many uses in agriculture, pharmaceuticals and beauty products.

Seferis calls himself a 'venture catalyst' – someone who influences a reaction without actually taking part in it. Through this donation, Seferis said he hopes to "catalyze a spirit of entrepreneurship, teaching and leadership" that will inspire UD chemical engineering students to create new innovations. He said the effort may also eventually seed start-up companies focused on sustainability issues.

"What is really interesting about UD is the integrative thinking and systemic approach to energy," said Seferis. "The beauty of this project is the opportunity to recycle not just oil, but also ideas that may now gain a foothold because of new technology, giving hope to the next generation," said Seferis.

He continued on, "Most commercial innovations are actually re-innovations. I'm investing in the University to engage the community with science, because the future in engineering is people."

Seferis is a distinguished educator in chemical engineering, management science, environmental health and technology. In addition to his research on polymeric composites, materials and processes, including clean energy, Seferis is a sought after advisor, consultant and lecturer in aviation, chemical and energy sectors.

He earned his doctoral degree in chemical engineering at UD in 1977. Following a distinguished thirty-year academic career at University of Washington in Seattle, with additional appointments at universities in Greece, Germany and Korea, Seferis founded GloCal Network Corporation (USA) in 2005 and currently serves as the firm's chairman, president and CEO.

## Senior Design Award honors former faculty member, David G.R. Short



**DR. DAVID SHORT** provided dedicated and excellent teaching in the chemical engineering department for more than ten years, and in the course of aiding us with our undergraduate teaching mission,

developed substantive and innovative curricula and teaching materials as well as provided guidance and mentoring to hundreds of chemical engineering students. In recognition of his extraordinary service the Department of Chemical Engineering establishes the David G.R. Short Senior Design Award. This honor, which includes a certificate of achievement and a cash award, is given to the senior design team in CHEG 432 Chemical Process Analysis that best exemplifies the traits that David so valued—namely a quality engineering design incorporating significant effort and personal initiative. The winning team will be determined by the instructors in CHEG 432 and awarded annually at the senior banquet.

## GRADUATING CLASS OF 2011

### Honors Degree with Distinction

The Honors Degree with Distinction recognizes a student's completion of the research requirements for the Degree with Distinction in addition to the successful completion of 30 credits in Honors courses through the degree program.

#### AMY CHEVALIER

*Effect of Changes; Disulfide Bond Network on G-Protein Coupled Receptors*

#### JOHN GARDNER

*Tungsten Oxide Thin Film Photoelectrodes for Use in Photoelectrochemical Solar Cells*

#### STANLEY HERRMANN

*First Principle Calculations of Adsorbate-Metal Interactions for Catalyst Design*

#### SEAN HUNT

*Experimental and Computational Studies of Palladium Monolayers on Carbides as Economically Viable Hydrogen Evolution Reaction (HER) Electrocatalysts*

#### NICHOLAS MARZE

*Quantifying The Relative Contributions Of Two Pathways To Odd-Chain-Length Fatty Acid Synthesis In 3T3-L1 Adipocytes*

#### DARIUSZ MURAKOWSKI

*Molecular dynamics simulation of protein adsorption to the vapor-liquid interface*

#### SUNEIL SEETHARAM

*Quality of Dissolved Organic Matter (DOM) in Runoff from Various Watershed Sources*

#### KEVIN TRAN

*Toward online control of the glycosylation patterns of monoclonal antibodies: modeling glycosylation at the ER/Golgi apparatus level*

#### SHARON WEAVER

*Mathematical Simulation of Drug Concentration in the Human Body*

#### MARK WEIDMAN

*The Electrochemical Stability and Properties of Transition Metal Carbide Catalysts*

## CLASS OF 2011:

### Where did they go?

#### 2011 placements at graduation

#### INDUSTRY..... 13

Gore.....	3
Amerada Hess .....	1
Applied Control Engineering .....	1
Croda .....	1
DuPont.....	1
Merck .....	1
Petrokemya.....	1
SABIC.....	1
Telvent .....	1
Software Developer .....	1
WhiteOptics .....	1

#### GRAD SCHOOL..... 11

MIT.....	3
Am. U. law .....	1
Austin .....	1
Berkeley.....	1
CMU.....	1
Hopkins .....	1
Houston.....	1
Penn .....	1
UVa .....	1

## In Memoriam

### Professor David G. R. Short Landenberg, PA

January 2011

David G. R. Short, 70, a University of Delaware chemical engineering professor, died at his home after battling a recurrence of cancer.

Short received his bachelor's, masters and doctoral degrees in chemical engineering from Purdue University, where he was a member of Triangle Fraternity (for engineering, architecture and the sciences). He served as an officer in the United States Army at Fort McClellan, Ala., in 1962-64 during the time of the integration of the University of Alabama. Upon graduation, he joined the DuPont Co. with assignments at Spruance, Va.; Washington Works, W.Va.; Corpus Christi, Texas; Chambers Works, N.J.; and Wilmington, Del. A professional engineer and a member of the American Society of Chemical Engineers, Short retired from DuPont Engineering in 2002 with 37 years of service. He subsequently served as a professor in UD chemical engineering department until his death.

"Dr. Short was an amazing professor. He was always available for help, whether it was with class or career advice. He had a profound impact on me and my classmates, and he will be dearly missed," UD alumna Amanda Mihok, B 2009, wrote on learning of his passing.

### James McGovern, B 2010

November 2010

James McGovern was a 2010 UD chemical engineering graduate and a 2006 graduate of Kennett High School, where he thrived in math and science. He had a long-standing interest in rockets and propulsion, and developed an interest in alternative energy during college.

Norman Wagner, chair of the department and James' mentor at UD, spoke at his memorial service saying, "It took me only a few minutes to realize he was really motivated and someone I really wanted to work with. He took the hard road at the University of Delaware and took the hardest classes in the department. He graduated with a chemical engineering degree and also completed an honors thesis. His accomplishments put him in a rare group." He was also an active volunteer firefighter with the Longwood Fire Company.

### Frank E. Rush Formerly of Newark, DE

July 2010

Frank E. Rush was the son of the late Frank E. and Minnie Dailey Rush. Frank joined the DuPont Engineering Department in 1944 and worked at Chambers Works, the Experimental Station, and Louviers where he retired as a Principal Consultant (Mass Transfer) in 1986. He was an adjunct professor of chemical engineering at UD from 1971-1980, a registered professional engineer for the state of Delaware, and an emeritus member and 50 year member of the American Institute of Chemical Engineers (AIChE). He was the DuPont representative to Fractionation Research, Inc. from 1972-1986 and to Washington University Thermodynamic Research Laboratory from 1970-1986. Frank is listed in "American Men and Women of Science" 14th Edition, 1979 and was elected as an AIChE fellow in 1983.

*Courtesy of The News Journal*

### David A. Taxter, B 1941 Eaton, OH

December 2010

David A. Taxter, 89, of Eaton, Ohio, was born on March 31, 1921, in Brooklyn, N.Y., son of the late David and Eugenia (Couche) Taxter. David was a 1941 graduate of the University of Delaware with a degree in chemical engineering and was a captain and pilot during World War II in the U.S. Army Air Corps. He was the owner of the Chrismer Agency Inc. in Eaton until his retirement. David was an avid bowler with a career high game of 288 and was a gunsmith and a member of the NRA.

# 2011 Notes from Alumni—Jon Olson

**RAJ ATALIA, MS 1957, PH.D. 1961,** had a career that began with eight years at Hercules, 21 years at the Institute of Paper Chemistry, 18 years with the USDA Forest Service Laboratory and Adjunct Professor in Chemical and Biological Engineering at Madison.

Major accomplishments include showing all native celluloses have two forms, Ia and Ib, and development of inorganic liquid-effluent-free pulping and bleaching systems. He has expanded on his invention of a process for producing nanoporous cellulose. His career achievements include the Anselme Payen Award of the Cellulose Division of ACS and multiple USDA awards, including the Forest Service Chief's Distinguished Scientist Award. He received the Aiken Prize, given by the Research Management Division of TAPPI, in May 2011.

Raj retired from the Forest Service in 2007 and established CSI to undertake basic research on cellulose under contract from NREL. When he became aware of the issue of recalcitrance in the production of cellulosic biofuels, he recognized that some work he had done in the 1970s could provide a solution; as Raj had developed a process for making cellulose nanoporous. Raj now has five folks working with him, including two former Ph.D. students from the 1970s recently retired from the paper industry. Their current work includes SBIR grants to commercialize technology in personal sanitary absorbent paper products (tissue, towels, diapers, etc.) and in the area of biofuels. They have developed a pretreatment of cellulose at room temperature and ambient pressure that increases its digestibility by enzymes by an order of magnitude.

**RENE J. BRAUN, B 1961, M 1969,** After he received his BChE degree he also obtained an MBA from the University.

Rene spent six years with Hercules in New Jersey in various manufacturing assignments; followed by 11 years with DuPont in manufacturing, marketing and finance, including special projects in Wilmington, Del. He also worked with FMC Corp. while they were launching a new class of insecticides. It was a very exciting time over the next 20 years being able to travel to most countries on all continents meeting people from all cultures. During this time, "my great wife Lois of almost 49 years took care of our son and daughter, as well as the household duties." Rene retired in 1997 and now enjoys consulting, dog walking and traveling. He is also active in local political parties.

For the 1961 Memory Book, Rene wrote: "I have very fond memories of Dr. Arthur Metzner, professor and chairman of the chemical engineering department. He was primarily responsible for always encouraging me not to give up and complete the demanding chemical engineering program. I was able to finance my 5+ year tenure at the University by working at all sorts of jobs, including doing some work at Dr. Metzner's home. I did manage to get a small Defense Department scholarship which enabled me to stay on campus during the last semester."

**ALVIN CONVERSE, M 1958, PH.D. 1961,** is retired from Dartmouth. He and Merry continue to live in Norwich, VT and Alvin still has an office at Dartmouth. His current technical interests focus on energy issues, and he has a paper on Seasonal Energy Storage in the June IEEE Proceedings. His contact with Bob Pigford was most beneficial for him, and Alvin remembered him fondly.

**RICHARD HUMPHREYS, B 1961,** received a National Science Foundation Fellowship to study chemical engineering at the University of

California, Berkeley following graduation. Upon completion of his studies at Cal, he served a two-year ROTC assignment in the army as a peace time platoon leader and later as a company executive officer. Richard took a European discharge from the army and traveled and skied about the continent for three plus months cementing his desires to live abroad.

Richard joined the Exxon Corporation in 1965 as a process engineer in Bayonne, New Jersey. Over the ensuing years he held 14 different assignments, including process supervision, economics, human resources, sales, marketing and business management, in New York City, Houston, Texas, Hong Kong, Brussels and Belgium. While he stopped working in an engineering capacity about three years into his career, he says "the disciplines learned in engineering school (planning, prioritization, problem solving) served him very well." His last assignment was in Houston, Texas, as Vice President and general manager of the Chemical Company's Intermediates Business in North and South America. He retired in 1999 with 35 years of service.

True to his desire, Richard spent eight years abroad; his son was born in Hong Kong and his daughter in Brussels. Today he and his wife are enjoying retirement, traveling the world and golfing. His children (both married, no grandkids) live in Houston and Austin, Texas.

**JOHN SUPANCIC, B 1961,** sent me a list of the firms for which he worked. The fun of collecting notes from alum is that some have a sense of irony and humor. In reply, I suggested there must be a "war story" in some of them. He replied with several; please enjoy the following:

Upon completion of manufacturing contracts, we formed a company—MATSCO—to supervise the insulation installation at Prudhoe Bay. After the Christmas trees were installed at the



drill pads, piping of various diameters were run to gathering centers where the oil, gas and water were separated. The crude surfaces at 190 F making insulation a must. I was required to hire union insulators, and slowdowns were common in order to keep the money machine flowing. The pipeline was insulated with insulation segments 22 feet long encased in metal jackets. The uninsulated pipe was jacked up from the pipe stands to install these segments. The union insulators installed at the rate of 1 linear foot per man hour, but substitute laborers installed at 10 linear feet per man hour. The union business agents wanted me to pad the payroll so they could collect more dues.

John left GE in 1997 with 10 years of service and retirement pension eligibility. He then worked for VonRoll Isola until 2003 as a technical manager, manufacturing manager and the west coast sales manager. In retirement he is active with family genealogy and web site design. He is now living in San Diego.

**JAMES VRENTAS, M61, PH.D. 1963**, joined the Process Fundamentals Research Lab at Dow Chemical in Midland, Michigan in 1963. In 1972, he accepted a faculty position at the Illinois Institute of Technology focusing on the fundamental aspects of diffusion and fluid mechanics. He moved to Pennsylvania State University in 1980 where, as the Dow Professor of Chemical Engineering, he still teaches and engages in research with his wife, Christine, an adjunct professor in the chemical engineering department. James is the recipient of two national AIChE awards, the William H. Walker Award for Excellence in Contributions to Chemical Engineering Literature and the Charles M.A. Stine Award for Materials Engineering and Science. At Penn State he has also been honored with the College of Engineering's Premier Research Award and several teaching awards.

James and his wife have two daughters, Cathy, a postdoctoral researcher in biochemistry and molecular biology, and Jenny, a sports reporter who covers the New York Jets for the Newark, N.J.-based Star-Ledger.

**JACK TINKLER, M, 1961, PH.D.**

**1963**, writes that since retiring from my position of V. P. Engineering and Technology for Elf Atochem North America, Inc. in 1993, my wife, Pleasants, and I have enjoyed retirement via a number of activities. Both of us are very involved with the Episcopal church. I am currently the Secretary of the Episcopal Church Club of Philadelphia, an organization of 270 lay people belonging to 60 churches in the Diocese of Philadelphia. We have season subscriptions to the Philadelphia Orchestra and the New York Metropolitan Opera.

Travel has been a big part of our lives. We have visited 30 countries throughout the world including Egypt earlier this year before the revolution there. One of our daughters married an Australian and has lived in a suburb of Sydney since 1993. We have visited three times. We will be in California in early June for the high school graduation of our granddaughter so will miss the reunion of the class of 1961.

UD brings back many good memories since that is where we met, got married and had our first child while I was working on my Masters and Ph.D. degrees and Pleasants was earning her bachelor's degree in English and music.

**DENNIS C. PRIEVE, M 1973, PH.D.**

**1975**, the Gulf Oil Foundation Professor of Chemical Engineering at Carnegie Mellon University, received the 2011 American Chemical Society Award in Colloid and Surface Chemistry. He also currently serves as president of the International Association of Colloid and

Interface Scientists (IACIS) and is one of four international editors of *Colloids and Surfaces A*.

Dennis joined CMU in 1975 after receiving a Ph.D. from UD and a B.S. from the University of Florida in 1970. Prieve's research interests focus on the nature and measurement of colloidal forces and their effect on transport of colloidal particles, especially electrokinetic phenomena and chemically-driven flows. Since 1987, he and his students have developed Total Internal Reflection Microscopy which uses evanescent-wave scattering and optical tweezers to measure sub-pico-newton colloidal forces between a single microscopic sphere and a flat plate without touching the sphere. He has been a visiting professor at Princeton University and the University of Melbourne, Australia. In 2007, he was awarded the annual Lectureship Award of the Colloid Science Division of the Japanese Chemical Society. He was elected a Fellow of the American Institute of Chemical Engineers in 2004, and received the AIChE Alpha Chi Sigma Award for chemical engineering research in 1995. Prieve chaired the 2002 Gordon Research Conference on Chemistry at Interfaces and co-chaired the 2004 International Electrokinetics Conference (ELKIN).

**THOMAS F. DEGNAN, PH.D. 1977**,

Manager, Breakthrough and Leads Generation, ExxonMobil R&E and the new Chair of the UD Department of Chemical Engineering's Advisory Council. He was awarded the 2010 AIChE Catalysis and Reaction Engineering Division Practice award, which recognizes individuals who have made pioneering contributions to the industrial practice of catalysis and chemical reaction engineering.

*Continued on next page.*

## Alumni Notes (continued)

The award citation states in part:

"Throughout his career at Mobil and now ExxonMobil, Thomas F. Degnan, Jr. has made important contributions in the application of shape-selective catalysis to many aspects of petroleum and petrochemical processing. He brought new understanding to the way the shape-selective materials work and to the relationships between their structure and chemical properties of the catalysts to the selectivity and specificity of the reactions they catalyze. This understanding has enabled rapid scale-up and industrial application in a number of important refining and petrochemical processes. In particular, Dr. Degnan has contributed significantly to the discovery, development and commercialization of at least ten new catalysts and associated processes for fuels and lubricant dewaxing and hydroisomerization, and for the zeolite-based synthesis of aromatics." In accepting his award, Tom gave a talk titled: "Catalysis in a Pocket: The MCM-22 Story."

**MIKE MUDROCK, B 1977**, began his career with Imperial Chemical Industries after graduation and stayed with the same entity for 22 years, despite changes in ownership, spending one year in Wilmington, two in Houston, then 20 years with Corpus Christi Petrochemical Company (CCPC), which became Equistar at the end of his tenure.

The first decade at CCPC was spent in process/project engineering functions—reducing energy usage, boosting production, solving process problems and implementing production upgrades to enhance profitability. The last several years were with the Safety/Environmental Department, maintaining compliance standards and interfacing with their corporate legal department.

In 2000, he left the chemical industry, relocated to Steamboat Springs, CO, and

entered real estate. He was elected to the Board of Directors at a condominium in Steamboat in 2002, then became president in 2004, a position he still holds.

Mike visited Newark in spring 2010 (his first visit since graduation), inspired by former classmate Michael Klein's return to the UD faculty. He and Mike K. were classmates from 7th grade through their undergraduate time on campus. He said, "Mike K. always had time to assist him with his academic struggles" and while on campus he thanked him for his kindness.

**JOANNA (SLOCUM) CONTI, B 1979**, writes that she is currently honing her analytical problem-solving skills, her UD BChE degree has been the foundation for a very diverse career. After several years as a Products Research engineer with Procter & Gamble, she was asked to become a Marketing Manager for Campbell Soup. Subsequently, she started a series of companies in the food, software and international marketing consulting.

In 2000, Joanna started an international non-profit Alliance for Youth Achievement, Inc. ([www.allforyouth.org](http://www.allforyouth.org)) which has helped orphans in Africa and Asia via micro-credit programs and in partnerships with other NGOs. In 2004, she became increasingly concerned with the direction our country was headed, and ran unsuccessfully for the U.S. Congress in Colorado. In 2006, she moved to Annapolis, MD where she studied foreign policy at Georgetown University, turned around a real estate education company, and returned to politics. In 2010, Joanna ran unsuccessfully for County Executive of Anne Arundel County.

**DENNIS DEVER, B 80**, and his wife, Joyce, MEEG 80, attended the Engineering Open House during Alumni Weekend in June. He commented that

right after graduation he married Joyce and moved to Houston to work for M.W. Kellogg. They moved to Delaware in 1991 and sent their four children to Wilmington Christian School. Two have finished college, one is in college, and the fourth is interested in UD.

Dennis is now a senior process engineer for Armstrong Engineering Associates, a company that makes specialized process equipment for companies in Korea, India and Saudi Arabia.

**PEDRO FERNANDEZ, M 1981**, is director of the Refining Practice at Jacobs Consultancy (a subsidiary of Jacobs Engineering) in Houston, Texas. He previously worked in refining and petrochemicals technology development for UOP, where he met his wife Elizabeth, a chemical engineer.

"Life and my career have been good to me. I am married and have two sons; one is studying Biomedical Engineering at Marquette, the younger one, Carlos, is a senior in high school and wants to be a chemical engineer. Carlos will be in the 2015 class of chemical engineers at UD.

**ERIC FRYWALD, B 1981**, has been in the news spotlight this year. The BP oil spill grew to 4.9 million barrels of crude (about ¼ of the UD daily consumption) and brought on the need for all remediation and spill control technologies. Nalco was able to supply 1.8 million gallons of Corexit 9500 and 9527, established oil dispersants, on very short notice. While there was environmental concern at first, EPA head Lisa Jackson concluded that the environmental impact of Corexits were the same as the alternatives. The press release quotes Frywald, "Looking back, we're proud of how we responded to the request for our dispersant material and that it helped reduce the environmental impact of the oil spill, including reducing the amount of oil that hit the shores,"

Eric wrote an interesting short paper, "Six Keys to Profiting in China" for the Bloomberg Business website. He opened by noting that three major US firms have not adjusted successfully to operations in China, HP, Google and Yahoo. In contrast, Nalco, IBM and KFC have been successful by practicing all of the keys.

Eric had a fabulous career with DuPont spending the last five years as a group VP for the agricultural and nutrition division. Of his prior life at DuPont he said: "My dad worked for DuPont, and it has always been a great company," he said. "I was a chemical engineer, and I was always interested in technology."

Eric moved to Nalco in February 2008.

*Material taken from press releases.*

**MARTIN HOPKINS, B 1982**, who works for Battelle in Aberdeen, Maryland, writes, in part:

"Thanks for the kind words about Katie (B 2015). Turns out she decided to switch from chemical to biomedical engineering at the end of her first semester. I think bio is what truly fascinates her. Now that Katie has moved on from CHEG, it's probably safe for me to show up at Colburn without mortifying her. Unfortunately a number of the profs that I interacted with the most have passed on—Pigford, Metzner, Asterita, McCoullough, Bischoff. As Katie mentioned, most of my career has focused on chemical demilitarization, although I haven't had the opportunity to interact with Sandler. I have run into him and Fraser Russell elsewhere a couple of times over the years. The first time I met Russell, the first words out of his mouth were, "did I give you a bad grade?" (I was never in his class.)

As I'm sure you know, Delaware is a pretty small place. Mike Chajes' and my other daughter carpool to high school together, and Mike Klein's mother-in-

law was our kids' Sunday school teacher. Katie and Bramie Lenhoff's daughter went to kindergarten together, but I had graduated by the time he arrived. I met the Lt. Governor last year, and we somehow made the connection that his father is Mort Denn. He also cautiously asked about my grade, noting that his father was a notoriously tough grader (unfortunately, a D in this case. I did retake the course and managed an A from Metzner.)"

**DAVID MEISTER, B 1984**, Columbia Law 1987, has been appointed to head the enforcement division of the Commodity Futures Trading Commission, which regulates derivatives in the same way the SEC monitor's securities. Experienced in investigating complex corporate fraud, David has over 20 years of white collar litigation experience. He spent time as a prosecutor in the Southern District of New York as a member of the Securities and Commodities Fraud Task Force. Previously he represented numerous individuals and corporations in matters involving securities litigation, insider trading, and complex accounting at Skadden, Arps, Slate, Meagher, & Flom (aka "Skadden").

*(Abridged from a press release)*

**ERIC SCHARPF, B 1985**, earned a Ph.D. at Princeton University, then worked at Air Products. Today he lives and works in New Zealand. When asked to describe how he got there, he responded:

"Finishing with a BChE from Delaware in 1985 did not immediately bring to mind the idea to relocate to New Zealand, but it did help make it possible. I had worked at Air Products for just under 10 years when a friend of mine mentioned an opportunity to take part in an engineering start-up company focusing on complex safety engineering services based on new global engineering standards. One of the places where these standards were first

being used was Australia. We looked at the business case and saw that we could make a reasonable go with a branch office in New Zealand. Having vacationed there previously, my wife and I were already looking to relocate there more permanently, so we decided to go for it. That was back in 1999-2000 and now, with two Kiwi kids and a successful launch of the exida company, we continue to enjoy life just outside of Dunedin, New Zealand. Fortunately the local sports team colors are blue and gold, so there is a good fit with that as well."

**LORI and ROB ALZAMORA, B 1986**, have worked at DuPont for 22 years. She currently leads the marketing organization in the Building Innovations business unit. Rob is a project manager for Siemens. Rob and Lori both have MBAs from UD (1998 and 1997 respectively). Lori wrote that they have twin 11-year old boys, Evan and Ryan, who actively participate in soccer, basketball, and baseball teams. For fun the family travels and collectively enjoys sports (especially baseball).

**RAY GARDNER, B 1986**, has worked at W.L. Gore & Associates since 1985. Over his 22 year career, he has served in a variety of roles including applications engineer, technical sales engineer, market specialist, product specialist and product champion across the Industrial Filtration, Fuel Cell Technologies, and Disk Drive Filtration Technologies businesses. In a reversal of roles, Ray became a stay-at-home dad to sons Matthew (now 12) and Andrew (now 11) in 2001, when his wife returned to work in Gore's Fabric division. During that time he also became a licensed realtor in Delaware, joining Keller Williams Realty in 2004. After a brief return to Gore in 2007 and a short time at Graver Technologies in 2008, Ray now works full-time in real estate. His wife Jane currently coordinates Gore's college recruiting program. Married since 1995, the Newark residents are

*Continued on next page.*

## Alumni Notes (continued)

active in school, community and sport activities, and they have travelled with the kids to Brazil, Costa Rica, and Mexico and throughout the U.S.

**JOHN MARKELS, B 1986**, has spent 25 years with Merck in manufacturing (aside from a break for grad school at UC Berkeley). His role has evolved from largely technical roles in chemical,



vaccine and drug product manufacturing to regional operations roles (running plants) and strategy roles. He is currently in charge of Merck's Emerging markets

strategy/business from a manufacturing/supply chain perspective, and has responsibility for Merck's contract manufacturing around the world.

After four years in Madrid, he now lives in Summit, NJ with his family: daughter Michaela (10), Luna (5) and his wife of 18 years, Rosalinda. He remains in touch with the department as a ChemE Advisory Council member for the last five years.

**CRAIG MAYLATH, B 1986**, after graduating from Delaware Craig worked for Nabisco Brands (along with classmate Mario DiFalco) as a project engineer. After three years, he left engineering and entered Temple University Medical School. Craig graduated in 1993 and went on to complete an internal medicine residency at Dartmouth in 1996. He completed a two-year General Internal Medicine Fellowship and earned an MPH degree at Boston University in 1998. After teaching and practicing at the Reading (PA) Medical Center for two years, Craig accepted a faculty position in the Department of Medicine at the University of South Carolina in 2000. In 2005, he completed an additional fellowship in Geriatric Medicine and for the past six years he

has continued to practice medicine and teach as a member of the Palmetto Health Senior Primary Care Practice. Craig lives with his wife Lisa (married in 1997) and two daughters, Madeleine (10) and Paige (8) in Chapin, SC. He enjoys reading, drawing and outdoor-based activities with his family.

**JIM OWENS, B 1986**, was recently promoted to President and CEO at the firm H.B. Fuller. He joined Fuller in 2008 after a distinguished 22 year career with National Starch where he held a range of management positions including vice president and general manager, Europe/Middle East and Africa; corporate vice president and general manager of the North American adhesives business; business director for the pressure sensitive and laminating adhesives businesses; marketing manager; and technical services manager. He previously served as president and CEO of the North American Division, the largest division at Fuller, where he delivered two years of profit growth that led the transformation of the company's Latin American businesses and has been instrumental in driving the company's worldwide growth agenda.

He writes: "It is hard to believe it has been 25 years since the University of Delaware experience. Though I never claimed to be a great engineer—the lessons of problem solving, perseverance and persistence in the face of difficult challenges were strengthened in the rigorous U of D Chemical Engineering program. We started with 125 classmates and graduated with less than 50. The U of D career center helped me find my first job at National Starch and Chemical and gave me the opportunity to travel and work around the world, including the four years my family lived in England. I am grateful to my fellow classmates and professors for those experiences and with them celebrate this 25 year anniversary with fond memories."

He and his wife, Janice (whom he met at UD), will celebrate 25 years of marriage this October. They have four children: James (21), Jennifer (19), Michael (17) and Matthew (11). James and Jennifer both attend Carnegie Mellon—James in electrical engineering and Jennifer in biomedical engineering/chemical engineering.

**DONNA PRAISS, B 1986**, is an extremely active alum of UD and Chemical Engineering. She was an organizer of the 25th reunion and was the Gift Committee Co-Chair. She was a speaker on the Women in Engineering program and contacted classmates encouraging them to attend the reunions. She also contacted most of the 1986 chemical engineering class for the 20th reunion in 2006.

Donna earned her JD from Boston University in 1989 after being inspired by taking UD's CHEG 595 Intellectual Property for Engineers and Scientists during her senior year, and currently practices intellectual property law in New York City. She is currently Of Counsel at Michelman & Robinson while continuing her search for a full-time position. She previously was the first female associate elevated to partner at Kenyon & Kenyon and also was a partner at Hunton & Williams. She is the Immediate Past President of the New York Women's Bar Association (NYWBA) and currently serves as Treasurer of the Women's Bar Association of the State of New York (WBASNY).

Donna, her husband, Chris, live in Riverside, CT with their four children, Eduard, Erika, Evan and Elisa. Donna recently appeared on a January episode of Martha Stewart about re-gifting after the holidays. Donna also has a special connection to the UD reunion: her parents lived across the street from UD President Pat Harker and family before they moved to Newark.



**BOB TILTON, B 1986**, is a professor at Carnegie Mellon with joint appointments in the chemical and biomedical engineering departments. He also is director of the Center for Complex Fluids Engineering and led the team that designed CMU's new biomedical engineering curriculum and devised the major's advising system. He earned a MS (87) and Ph.D. (91) at Stanford working under the direction of Channing Robertson and Alice Gast, now president of Lehigh. His broad research interests are dependent on expanding the understanding of interfacial physical chemistry. In 2010 he became an ACS Fellow, and he has been honored with the Victor K. LaMer Award for his work in colloid and surface chemistry. His current research includes biopharmaceutical formulations, organic/inorganic composite nanoparticles and nanotechnology for environmental remediation. He and his wife Julie have two sons, Ian (13) and Aaron (10).

**LORI (TORRY) MCDOWELL, PH.D. 1993**, was elected fellow of the AIChE in September 2010. Currently she is the business development manager at Praxair. She previously was the Pipeline Business Manager at Praxair and also worked at W.R. Grace. Active in AIChE, she is now vice chair to the Fuels and Petrochemical Division. Additionally she is the president-elect of the Women's Energy Network in Houston. Always very fit, she is a member of the Praxair cycling team and rode in the BP MS 150, a two day Houston—Austin jaunt to support MS. She and her husband, Frank, and son, Hunter, live in Humble, TX.

**JESSIE GOELLNER, B 1995**, writes that the past year or so has been one of tremendous (positive) change in his life. In April 2010, while sitting in a meeting with his old Exxon VP and his [then] current boss in Houston, he got the call that Sonja's water broke in Pittsburgh (a

month early). Jessie made it in time for the birth of their healthy son, Frederick, who has radically changed his priorities and outlook—all to the better.

Circumstances then dictated that he needed more stability than start-ups offered so he left Capital Technologies International (CTI). CTI was start-up number #2 (novel process technologies in renewable and fossil fuels). Jessie's first, Powercast, is doing pretty well (now that they are strictly following the business plan he wrote after much diversion). Needing more stability he joined Booz Allen Hamilton to lead their Energy Infrastructure analysis team. Jessie splits his time about 60% in support of NETL (and Tom Tarka, B 96, is his best NETL client) and 40% other aspects of energy and technology commercialization/strategy.

His wife, Sonja (AS '94) currently works as a business analyst at Giant Eagle.

**SUJATA BHATIA, B, M 1999**, is now a faculty member at Harvard University's School of Engineering of Applied Sciences. As assistant director for Undergraduate Studies in Biomedical Engineering, she will work with undergraduates majoring in biomedical engineering and teach bioengineering courses beginning this fall. In particular, she will work with bioengineering seniors on their senior design projects, involving new research and biomedical device design. She hopes to publish with her undergraduates and ultimately, "achieve the rank of 'Professor of the Practice of Biomedical Engineering' at Harvard University."

She writes: "I really love the fact that Harvard has an engineering school in the context of a very strong liberal arts environment. And the engineering school really values my MD/Ph.D., and is hoping that I can forge some connections between the engineering school and the Harvard hospitals."

**ASHLEY COOPER, B 1999**, started with Exxon Research and Engineering Co. in Florham Park, NJ. His first assignment was in the Fractionation and Thermodynamics Section developing process simulations for distillation towers as well as updating hydrocarbon physical property prediction models. In 2000, he move to Fairfax, VA after the Exxon/Mobil merger. After that, he worked in the Process Engineering focusing on distillate treating and membrane separation research. This assignment morphed into the Fractionation Technology area developing multiple distillation tower revamp designs. In 2004, Ashley relocated to Baton Rouge, LA to work at EOM's Research Laboratories in a group tasked with mitigating heavy hydrocarbon heat exchanger fouling. In 2006, he moved to the Baton Rouge Refinery and had two back-to-back process engineer assignments; the first on the Cyclic Reformer and Naphtha Hydrotreating units, and the second on the Large Pipestills (Crude units). In 2007, Ashely became the Senior Technical (Complex) engineer on the Pipestills, where he currently works in turnaround project planning, unit optimization/troubleshooting, and technology deployment.

**REBEKAH COOPER, B 2001**, started her career with ExxonMobil as a process design engineer at the Engineering Headquarters in Fairfax, Virginia, during which she traveled extensively, including assignments in Romania, Thailand, England and Baytown, Texas.

Ashley and Rebekah have been in Baton Rouge since late 2004. Rebekah is the ExxonMobil Team Captain for Recruiting at UD and stays in touch with a number of UD grads, including Dan Miller and Kate Thompson, Mary Moore (formerly Garcia) and Kim Twambley (formerly Dunham).

*Continued on next page.*

## Alumni Notes (continued)

**R. BERTRUM ("BERT") DIEMER, M 1980, PH.D. 1999**, has been employed at DuPont since his graduation from Lehigh in 1973. He currently is an Engineering Fellow in the DuPont Engineering's DuIT organization. He has been an adjunct faculty member of the department since 2003, and this year he took over the teaching responsibilities of the late David Short in the senior design course. For the last three years Bert has co-taught CHEG 835 Applied Chemical Kinetics, the first grad kinetics course, with Dion Vlachos and Raul Lobo. A dedicated and skilled teacher, he brings a wealth of industrial experience which aids in developing problems sets and exams. He is a valuable addition to our program.

**HARVEY JOHNSON, HB, 2001**, earned a chemical engineering Ph.D. at Berkeley in 2006. He spent time on Wall Street before returning to UD for post-doctoral work with Bramie Lenhoff's group. In early 2009, he collaborated with Bramie on a project investigating the phase behavior of commercially relevant therapeutic antibodies. The work resulted in a talk at the annual ACS meeting and an upcoming paper. With the work on the project finalized, his fiancée, Neelima Reddy and Harvey took positions as teachers at St. Andrew's School in Middletown, DE. Neelima teaches English and Harvey teaches Math and Science.

**BEN KIBALO, B 2001**, began his career as a pharmaceutical formulations chemist at Shire Laboratories, where he contributed to the development of Adderall XR, a treatment for ADHD. Ben also met his future wife Nicole at Shire Labs. He spent four years with Ethicon (J&J), where he participated in early concept development for many surgical applications—including a unique, partially-absorbable, minimally invasive, self-deploying hernia mesh based on Ethicon's PROCEED (anti-adhesion technology). Ben was recruited to LifeCell,

a self-proclaimed regenerative medicine company, and spent four years working on concepts involving their current technology, including hernia meshes and wound dressings, and in production yield improvement. In 2010, he joined ACell, Inc., and works on a unique technology called MatriStem, a decellularized porcine bladder that has shown amazing results in late stage diabetic wound care healing, soft tissue support, digit regeneration after amputation and many other areas. Nicole and Ben have a 17 month old daughter, Natalie and live in Maryland.

**JAMES ROMESBERG, B 2001**, of Newark, Delaware, now works for Dow Chemical in the Advanced Materials Division in the Electronic Materials Business Group. He previously worked for Sunoco in Philadelphia and Marcus Hook, PA. He writes: "I started in November '10 and work in Chemical Mechanical Planarization (CMP) Technologies as a Production Engineer, specifically supporting high volume manufacturing of liquid CMP products (slurries).

Polishing pads and slurries are made at the Newark site. These products are used in the semiconductor industry to prepare the surface of the wafers prior to photo etching. Though it does have its challenges, it is very exciting to be working in a new industry for a new company."

**TOSHAL ROY, B 2001**, is a ten year employee of Procter & Gamble's Hunt Valley, MD site. Currently he is a Group Manager in the company's Supply Chain Operations function. He married Garima Sharma, a cardiologist from Philadelphia, in 2010. He still keeps in touch with a group of UD Chem E alums.

**JENA PRICE SINGER, B 2001**, spent five years at Merck before joining Johnson & Johnson where she is a Sr. Commodity Manager in the global R&D procurement group, supporting vendor management and negotiations for technology and supply chain for clinical trials. She met her husband, Dan Singer, BS 2000, while vacationing at Ocean Beach, Fire Island.



*Pictured from left, Dana Kolesar '01, Toshali Roy '01, Harvey Johnson '01, James Romesberg '01, Ben Kibalo '01 and including Harvey's brother-in-law, not pictured James DePrisco, '90 BChE, who attended Harvey and Neelima's wedding in Puerto Rico this year.*

They live in Manhattan, have a dog and take advantage of the cultural life there.

**ANDREW STAMPS, B 2001**, and **DAVID PAJEROWSKI, B 2001**, both worked for Physiome Sciences until their startup company changed management. Andy then earned a Ph.D. at U. South Carolina under the direction of Ed Gatzke, Ph.D. 2000. Andy also completed a post doc with Ralph White at Carolina. He then joined Air Products where he is a principal modeling engineer and, as his title implies, his work is focused on model building and dynamic simulations. Andrew and Meghann Kreiger Stamps, AB 2000 & MA 04, have two-year-old twins, Gwyn and Cole; they are currently expecting their third child.

**DAVID PAJEROWSKI, B 2001**, completed a Ph.D. in Bioengineering at Penn under Professor Dennis Discher in 2008; after which he joined Merck as a Process Engineer where he works on process characterization, improvement, and new process development supporting commercialized viral vaccine manufacturing processes. David lives in Lansdale PA with his wife, Deborah (who is currently expecting) and their two-year old son, Tyler. David and Deborah see Andy, Meg and the Stamps twins pretty regularly, as well as Eileen Paschik Khan (BChE 2002) and Rishi Khan (Computer Engr UD 2000, Ph.D. EE 2007), and their son Ian. Eileen is expecting twins this summer."

**BRAD TAYOR, B 2001**, earned at Ph.D. at Purdue in 2005 before joining PhillipsConoco as a research engineer. Now a group leader, he writes: "In November, I took over as Director for the Advanced Hydrocarbon Fuels group, a small group of 6 researchers and 3 technicians responsible for long term research on fuel reformulation. We do a mix of research on meeting future regulatory requirements and fuel blends

for advanced engines. It is one of the few groups with a research horizon in the 15 year range, which gives us a chance to play in areas that may stray from traditional petroleum processing." Brad returns to UD twice a year to recruit Ph.D. candidates for Research and Development and often finds himself interviewing students of his former teaching assistants. "We are looking forward to Bharat Boppana joining our Hydroprocessing research group later this summer." He lives in Tulsa.

**KIMBERLY (DUNHAM) TWAMBLY, B 2001**, is a senior editor for Chemical & Engineering News, the weekly newsmagazine of the American Chemical Society, in Washington, D.C., where she manages a staff of four. In 2009, Kim had the opportunity to write an article about Dr. Lenhoff winning the ACS Award in Separations Science & Technology. She is married to Tom Twambly, AS 2001, and they live in Alexandria, Va. She keeps in touch with fellow ChE grads Jen (Serek) Vitale, Bekah (Sadowsky) Cooper, and Sheri Sampson.

**LEVI T. THOMPSON, B 1991**, the Richard E. Balzhiser professor of chemical engineering, professor of mechanical engineering, and director of the Hydrogen Energy Technology Laboratory at the University of Michigan and returned to the department on May 13, 2011 to give his seminar, "Towards Sustainable



Production: Design and Synthesis of Nanostructured Materials." His research group focuses on improved catalysts for the water gas shift route for hydrogen production. Among other things his work shows that core-shell catalysts consisting of nanoscale carbide particles supported

on high surface area alumina and decorated with thin layers of platinum have extraordinary activities. He has won many awards, including the UD Outstanding Alumni award in 2005.

Classmates will remember Levi as an accomplished basketball player, having played on the UD team and in graduate school scrimmaging UM players. Asked if he were still active in "hoops", he said no, but his 14 year old daughter is 6' 2" and really good, "perhaps with collegiate varsity potential."

**TOM TARKA, B 1996**, works for the U.S. Department of Energy at NETL. His focus involves assessing indirect liquefaction of coal and biomass systems. The work remains interesting and topical, which is how he likes it. Tom has had the opportunity to work and hang out with Jesse Goellner, B 1995, a bit, as he just started working for Booz Allen Hamilton, one of their site-support contractors. Tom gave a talk in April at the AIChE local section meeting, where he reconnected with Dady Dadyburjor, Ph.D. 76.

**JOHN HEINZEL, B 2002**, is now a Senior Chemical Engineer with the U.S. Navy in Philadelphia. His work focuses on ways to improve shipboard energy efficiency, including fuel cell and liquid fuel processing/reformation techniques as well as advanced energy storage technologies (electrochemical and mechanical). He oversees technological improvement in the design and construction of shipboard electrical systems from the KW to MW scale. These new technologies have fuel efficiencies roughly twice that of conventional diesel and gas turbine systems. He writes: "The Secretary of the Navy, Ray Mabus, recently announced one of my programs, and it was exciting to be present and hear the ideas and concepts described from on high." John is still pursuing his Ph.D. at Auburn.

*Continued on next page.*

## Alumni Notes (continued)

He works closely with two other UD ChE's: Ian Peek B02 and Frank Gulian, B 83.

**JOHN BISHOP, B 2003**, received his Ph.D. in 2010 from Princeton University and worked with Rick Register. His dissertation studied polymers and block copolymers made from ring-opening metathesis polymerization (ROMP). ROMP is an application of olefin metathesis. This past year he was a post doc at UD working with Antony Beris and Norm Wagner on a project to identify the causes of defects in the polymer insulation of large (>2" diameter) power cables. He used computational fluid dynamics and polymer melt rheology experiments to understand this problem. In August 2011 he joined the DuPont Experimental Station in the Packaging and Industrial Polymers (P&IP) business unit as a research investigator. P&IP's most widely known products are Surlyn® ionomers, ethylene/methacrylic acid copolymers neutralized with a metal cation, materials that are extraordinarily tough plastics, and also have additional outstanding properties such as oil and tear resistance and high optical clarity.

**MARK SHIFLETT, M 1998, PH.D. 2002**, returned to the Department this spring as an adjunct faculty member to teach a portion of CHEG 345, the junior year laboratory. According to Prasad Dhurjati, Mark was "an excellent teacher and innovator." Now a Senior Research Associate at DuPont, Mark leads two teams on major development projects, a new process for manufacturing TiO<sub>2</sub>, and developing new absorbents for removing CO<sub>2</sub> from flue gas. He is also working on a new sustainable, high-efficiency cooling process. Mark is author of over 60 publications and holds 25 patents. He previously received a DuPont Presidential Citation for development of hydrofluorocarbon refrigerant mixtures.

**ERIC PRIDGEN, B 2003**, dropped by during reunion weekend, and shared that after three years at Merck, he began pursuing graduate study at MIT. His dissertation work, directed by Bob Langer, is to develop an oral delivery system for insulin via receptor targeted nanoparticles. The receptor facilitates the transport of particles across the intestine and allows the insulin to reach the blood stream. Eric has developed this concept successfully in mice. The next step is to transfer these results to one of Langer's many startup companies. He plans to do a post doc year after finishing at MIT. He is engaged to Wenny Lin, BS 03 in biochem, who now is a fellow at the National Cancer Institute.

**IVAN BALDECHEV, B 2006**, completed his Ph.D. at Penn under the direction of Ray Gorte and John Vohs; "Study of Red. /Ox. Thermodynamic and Catalytic Properties of Metal Oxides Materials." He was hired by DuPont as a Research Investigator in the Chemicals and Fluoroproducts division at the Wilmington Experimental Station. In 2009, he married Kelly Ann Tomko. They live in Wilmington.

**WILLIAM ESKUCHEN, B 2006**, lives in Hoboken, NJ and works at ConocoPhillips Bayway Refinery in Linden, NJ, as a process engineer. He is responsible for several units, including the Distillate Hydrotreaters which produce ULSD (Ultra Low Sulfur Diesel) and the Wet Gas Scrubber. He previously worked as a process design engineer, responsible for developing new projects. He enjoys that Hoboken is close to the culture and entertainment of greater New York City.

**DANIELLE MAUZ, B 2006**, moved from Rohm & Haas to Dow when R&H was acquired by Dow. She writes: "Since graduation, I took a job outside of Philadelphia with Rohm and Haas and then after a year and half, took a "temporary" assignment in Houston, TX. I have had three jobs while at the

Deer Park/Pasadena site while in Texas, currently transitioning to my new role as the Manage Production Work Process leader for the Deer Park and three other sites in the area. I have become more involved in SWE and am currently mentoring a chemical engineering co-op student at work.

**MARK A. SNYDER, PH.D. 2006**, received an award from the Computing and Systems Technology (CAST) division of the American Institute of Chemical Engineers. Mark is the P.C. Rossin Assistant Professor of chemical engineering and received CAST's 2010 W. David Smith Jr. Graduation Publication Award "for published work on the application of computing and systems technology to chemical engineering." His winning paper, "Mesoscopic Modeling of Transport and Reaction in Microporous Crystalline Membranes," was published in Chemical Engineering Science. Snyder earned his B.S. in chemical engineering from Lehigh in 2000 and his Ph.D. from UD in 2006.

**JUSTIN SPAETH, B 2006**, is currently pursuing a Ph.D. in chemical engineering at Princeton University, working with Profs. Thanos Panagiotopoulos and Yannis Kevrekidis. He plans to hold a thesis defense in Sept. 2012, with a tentative title being "Using Coarse-Grained Molecular Simulation to Model the Cooperative Self-Assembly of Polymer-Protected Nanoparticles." He will join McKinsey and Company as an associate in their Philadelphia office in January 2012. He enjoys playing golf and the piano. Justin is in good health after a short run-in with testicular cancer in spring 2007.

**BRIAN STEUER, B 2006**, worked for ExxonMobil in a rotational program at three locations: Fairfax Central Engineering Office (CEO), Baytown Olefins Plant (BOP), and Beaumont Refinery. His responsibilities have included process support for twelve lube plants spread



around the globe; progressing large capital projects from development to detailed design; and technical lead in Beaumont responsible for long term process unit health/vulnerabilities and mentoring recent graduates in the Crude/Lubes/Flare Gas area.

**MARK YOCUM, B 2006**, just completed his first year at Harvard Business School in Cambridge, MA, where he is pursuing his MBA full-time. He will be working in New York, NY this summer in the Institutional Equities Trading Division of Morgan Stanley. Ideally, Mark would like to return to Morgan Stanley full-time after graduation or pursue a career in oil or natural gas trading. He previously worked at Sunoco as a process engineer in South Philadelphia, with rotations on Sunoco's newly revamped ULSD hydrotreaters, and later on the Girard Point FCCU that underwent a \$500MM revamp in 2007. In 2009, Mark left the refinery to work at Sunoco's corporate headquarters on a special assignment related to crude purchasing and logistics optimization. He remains in frequent contact with Justin Spaeth '06.

**MELISSA DAY, B 2009**, is a second year grad student at CMU where she has won a NSF graduate research fellowship. A member of Center for Atmospheric Particle Studies (CAPS), she works with Spyros Pandis to model the effect of temperature and other climate change factors on organic aerosol behavior. This is of particular interest because excess atmospheric particulate matter directly impacts human health. Emission, processing, and distribution of species are modeled over the eastern U.S. by PMCAMx, a state-of-the-art chemical transport model. The CAPS program couples modeling with experimental facilities and works across department boundaries, which enables for swift revision to bring the program up to date. In her free time, Melissa works with CMU's Engineers Without Borders (EWB) chapter, continuing an interest that

developed at UD. The chapter has just begun construction of a water pumping system in the Ecuadorean Andes.

**NICK MAURO, B 2009**, started work with Novartis Vaccines & Diagnostics in Holly Springs, NC in 2009. Novartis facility is a green field start-up but will produce pandemic and seasonal flu vaccine when fully operational. Nick works in the Bulk Manufacturing department as a production engineer, managing two unit operations (an ultrafiltration/diafiltration unit and a chromatography unit). He tries to keep in touch with as many UD folks as possible, especially the CHEG majors.

**ZACK WENDEL, B 2009**, works for ExxonMobil in Beaumont, TX. He began as a design engineer, and, last September, took on a new role as a business analyst managing the Beaumont Engineering Division budget of about \$41 million. Zach states "While making sure spending is on track, developing future budgets and helping plan staffing levels are unlike the tasks of a design engineer, they do bring new and exciting challenges—cutting costs is a never-ending task and it's interesting to be in the middle of the discussion." Outside of work, Zach enjoys exploring Houston, Austin, San Antonio, and New Orleans—all, he says, are within an afternoon's drive, and offer their own unique culture and activities. He hopes to return to UD this fall for recruiting.

**CAROLYN (SLUSSER) HAMILTON, B 2011**, has been in the DuPont Field Engineering Program for a year. Her first assignment is in the DuPont Capital Asset Productivity Group (DuCAP) as a process engineer on the detailed design of large capital projects. The work has been interesting and eye opening in learning all that is involved in executing capital projects. She's been in Mississippi and Louisiana visiting vendors, inspecting equipment, and talking with engineers, operators and maintenance groups. Her

rotation with DuCAP will last two more years and then she will choose her next assignment. She married David Hamilton (CPEG '08), on May 6, 2011 in Rehoboth Beach, DE. They are now "Double Dels." She writes: "How special it was to have many UD students and alumni there to celebrate the day including her fellow CHEGers Christina Gilchrist, Katie Wiseman, Abdal Kader Barakat, Andrew Kroestch, and Andy Damiani."

## UDCONNECTION

Looking for an old friend? Want to share your latest news? Searching for information on upcoming alumni events such as Homecoming? Now you can do it all in one place, [www.UDconnection.com](http://www.UDconnection.com). UD and the UD Alumni Association (UDAA) have collaborated to bring alumni a vibrant online community—so register and get active! The online community allows you to search the alumni directory, post class notes, update your contact information, and see if there are any upcoming alumni events in your area. You can also take advantage of networking opportunities and ways to get involved with your alma mater! Visit [www.UDconnection.com](http://www.UDconnection.com) today!

# Class Reunions

Homecoming is November 11–13, 2011. Please see UD's Alumni Relations website, [www.UDconnection.com/homecoming](http://www.UDconnection.com/homecoming) for details about Homecoming Weekend. Our highlighted reunions: 50 year, 25 year, 15 year and 5 year—come join your former classmates at Homecoming.

## Class of 1961

- Dr. George Ember ('61/EG)
- Mr. Bruce Fain ('61/EG)
- Mr. John A. Donaldson ('61/EG)
- Mr. Ernest M. Eissele, Jr. ('61/EG)
- Mr. James B. Dunson, Jr. ('61/EG)
- Mr. John L. Pence ('61/EG)
- Mr. Paul K. Mattheiss ('61/EG)
- Dr. W. Randall Williamson ('61/EG)
- Dr. William T. Houghton ('61/EG)
- Mr. Charles C. Wolfe ('61/EG)
- Mr. Lawrence J. Logan, Jr. ('61/EG)
- Mr. James M. Steinhoff ('61/EG)
- Dr. James S. Vrentas ('61/EG)
- Mr. Rene J. Braun ('61/EG)
- Mr. Richard F. Humphreys ('61/EG)
- Mr. Austin J. Edison ('61/EG)
- Mr. Michael F. Baber ('61/EG)
- Mr. J. Morris Binder ('61/EG)
- Dr. Henry H. Gunther ('61/EG)
- Mr. James J. Behen III ('61/EG)
- Mr. Norman T. Mills ('61/EG)
- Dr. James L. Throne ('61/EG)
- Mr. Dean E. Leib ('61/EG)
- Mr. Dale W. Bowins ('61/EG)
- Mr. Charles L. Hill ('61/EG)
- Mr. George L. Fish ('61/EG)
- Mr. John A. Supancic, Jr. ('61/EG)
- Dr. James W. White ('61/EG)
- Mr. Harold N. Kenton, Jr. ('61/EG)

## Class of 1986

- Dr. Bryan C. Hoke, Jr. ('86/EG)
- Mrs. Donna G. Stevenson ('86/EG)
- Mrs. Brenda L. Haumesser ('86/EG)

- Mr. Raymond G. Gardner, Jr. ('86/EG)
- Peter A. Lindholm, P.E. ('86/EG)
- Mr. Mark S. Koskiniemi ('86/EG)
- Mr. David J. Buttner ('86/EG)
- Dr. Yung-Herng Yau ('86/EG)
- Dr. John M. Nahay ('86/EG)
- Mr. Mario DiFalco ('86/EG)
- Dr. Deepak Doraiswamy ('86/EG)
- Dr. Jaime S. Boaventura ('86/EG)
- Dr. Kevin P. McAlea ('86/EG)
- Mrs. Michelle M. McKenna ('86/EG)
- Ms. Ui Y. Choi ('86/EG)
- Mr. Kevin W. Houang ('86/EG)
- Ms. Sarah E. Galt ('86/EG)
- Mrs. Jeannette Cona-Larock ('86/EG)
- Mr. Scott T. Lazarczyk ('86/EG)
- Mr. Anthony Tillman ('86/EG)
- Donna M. Praiss, Esq. ('86/EG)
- Mrs. Lori Petrovich Alzamora ('86/EG)
- Dr. Kun-Hong Lee ('86/EG)
- Mr. Peter J. Kurylak ('86/EG)
- Dr. Joseph P. Scott ('86/EG)
- Mr. William B. Foster, Jr. ('86/EG)
- Mr. Robert J. Munion ('86/EG)
- Dr. Lora L. Spangler ('86/EG)
- Mr. Joseph LaDana ('86/EG)
- Nick N. T. Lomis, M.D. ('86/EG)
- Dr. I-Hwa Lee ('86/EG)
- Mrs. Michele B. Burroughs ('86/EG)
- Mr. Michael D. Nagle ('86/EG)
- Mr. David T. Escott ('86/EG)
- Ms. Sharon L. Watkins ('86/EG)
- Mr. Daniel P. Hagewiesche ('86/EG)
- Laura Depfer Koch, M.D. ('86/EG)
- Mr. David J. Marchese ('86/EG)
- Dr. Daniel C. Kim ('86/EG)

- Mr. James J. Owens ('86/EG)
- Ms. Jeanne K. Bernards ('86/EG)
- Dr. Brian A. Stern ('86/EG)
- Dr. John B. McDermott ('86/EG)
- Mrs. Gretchen A. Kunas ('86/EG)
- Mr. Stanley B. Tam ('86/EG)
- Dr. Amod A. Ogale ('86/EG)
- Dr. John H. Markels ('86/EG)
- Dr. Concetta LaMarca ('86/EG)
- Mr. Robert T. Alzamora ('86/EG)
- Mrs. Catherine J. Gow ('86/EG)
- Mr. James T. Turnbull ('86/EG)
- Dr. Paul D. T. Huibers ('86/EG)
- Craig F. Maylath, M.D. ('86/EG)
- Dr. Alan J. Kishbaugh ('86/EG)
- D. Jennings Meincke, Esq. ('86/EG)
- Dr. Robert D. Tilton ('86/EG)
- Mrs. Rekha M. Sheth ('86/EG)
- Christopher R. Lewis, Esq. ('86/EG)
- Mr. John A. Horstman ('86/EG)
- Mrs. Chris L. Susman ('86/EG)
- Mr. James R. Lawson ('86/EG)
- Dr. Shau-Lin F. Chen ('86/EG)
- Mr. John C. Frankosky ('86/EG)
- Ms. Lorraine M. Adamz ('86/EG)
- Dr. Gloria I. Straguzzi ('86/EG)
- Mr. Michael L. Gilbert ('86/EG)
- Dr. Kathleen A. Jurman ('86/EG)

## Class of 1996

- Mr. Derrick J. Clayton ('96/EG)
- Paul Wei-Tse Huang, M.D. ('96/EG)
- Dr. Laura L. Brasher ('96/EG)
- Rachel A. Causak, M.D. ('96/EG)
- Stamatios Stamoulis, Esq. ('96/AS)
- Mrs. Vanita P. Desai ('96/EG)

# ALUMNI

- Mrs. Anna M. Trievel ('96/EG)
- Mr. Eric H. Olsen ('96/EG)
- Mr. C. Bruce Phillips, Jr. ('96/EG)
- Mr. Christopher R. Cooke ('96/EG)
- Dr. Kwok-Leung Tse ('96/EG)
- Dr. Beth A. Watson ('96/EG)
- Mr. John P. Gulli ('96/EG)
- Dr. Keith G. Pierce ('96/EG)
- Mrs. Melissa L. Schrock ('96/EG)
- Dr. Kate M. Lusvardi ('96/EG)
- Ms. Tara K. Smith ('96/EG)
- Dr. Narahari S. Pujar ('96/EG)
- Mrs. Michelle L. Wyatt ('96/EG)
- Mr. Daniel F. Ziegler ('96/EG)
- Dr. Steven P. Wrenn ('96/EG)
- Dr. R. Sureshkumar ('96/EG)
- Dr. Stavroula Morti ('96/EG)
- Mr. Christopher V. Avino ('96/EG)
- Mr. Alan D. Braem ('96/EG)
- Mr. Jason T. Matocha ('96/EG)
- Dr. Johan B. Bergenholtz ('96/EG)
- Mr. William T. Turay ('96/EG)
- Mr. Ramesh Mahadevan ('96/EG)
- Mr. Christopher M. Fischer ('96/EG)
- Mr. Robert D. Umberger ('96/EG)
- Mr. Jason E. Tiffany ('96/EG)
- Mr. Eric T. Go ('96/EG)
- Dr. Ratna Shekhar ('96/EG)
- Mr. Samuel K. Yohannes ('96/EG)
- Mr. Kemal F. Helmi ('96/EG)
- Dr. Steven R. Kline ('96/EG)
- Mr. Jeffrey E. Troyan ('96/EG)
- Mr. Chad C. Waraksa ('96/EG)
- Dr. Andrew S. Luk ('96/EG)
- Mrs. Teresa J. Dober ('96/EG)
- Dr. Sudhakar Balijepalli ('96/EG)
- Mr. Christopher W. Blenk ('96/EG)
- Mr. Matthew R. Winkler ('96/EG)
- Mr. David H. Herman ('96/EG)
- Mrs. Carolyn L. Jackson ('96/EG)
- Mr. Thomas J. Tarka ('96/EG)
- Ms. Deborah A. Moore ('96/EG)

- Mr. Christopher J. Golie ('96/EG)
- Dr. David L. Malotky ('96/EG)
- Mr. Peter J. Wyatt ('96/EG)
- Ms. Roseann Patrick ('96/EG)
- Mrs. Jennifer L. Schmitt ('96/EG)
- Dr. Anne Counterman Burba ('96/EG)
- Dr. Dennis J. Michaud ('96/EG)

## Class of 2006

- Mr. Bryan E. Steuer ('06/EG)
- Mr. M. Jacob Alvarez ('06/EG)
- Ms. Jessica L. Pippins ('06/EG)
- Ms. Danielle M. Mauz ('06/EG)
- Mr. Robert A. Clemente ('06/EG)
- Mr. George W. Brown ('06/EG)
- Mr. Michael R. Rasch ('06/EG)
- Mr. James M. Wilson ('06/EG)
- Mr. William J. Crandley III ('06/EG)
- Mr. Geoffrey M. Oxberry ('06/EG)
- Dr. Michael C. Enever ('06/EG)
- Mr. Jason E. Warren ('06/EG)
- Mr. Sean A. Mulligan ('06/EG)
- Mr. Ryan P. Ritz ('06/EG)
- Mr. David B. Silowka ('06/EG)
- Mr. Stephen C. Ramick ('06/EG)
- Dr. Ping Xu ('06/EG)
- Mr. Nicholas J. Leone ('06/EG)
- Dr. Mark A. Snyder ('06/EG)
- Ms. Hongguang Huo ('06/EG)
- Mr. Alex J. Alfrey ('06/EG)
- Mr. Kevin S. Andrews ('06/EG)
- Mr. Ivan Baldychev ('06/EG)
- Dr. Jung-Hwa Kim ('06/EG)
- Mr. F. Colin Busby ('06/EG)
- Ms. Adrienne E. Klotz ('06/EG)
- Ms. Samantha L. Bronner ('06/EG)
- Mr. Christopher J. Walker ('06/EG)
- Mr. Andrew S. Klein ('06/EG)
- Dr. Aldo Acevedo ('06/EG)
- Ms. Sara B. Cromyak ('06/EG)
- Ms. Elizabeth J. Oeffinger ('06/EG)
- Mr. Matthew A. Mitsche ('06/EG)

- Mr. Benjamin J. Feist ('06/EG)
- Dr. Sara Powers ('06/EG)
- Dr. Lin Zhu ('06/EG)
- Ms. Rachel M. Adams ('06/EG)
- Mr. Matthew J. Decker ('06/EG)
- Mr. Zhuoyang Lian ('06/EG)
- Dr. Seth M. Washburn ('06/EG)
- Mr. Andrew T. Peiffer ('06/EG)
- Mr. Andrew R. Novotny ('06/EG)
- Ms. Sara E. Hartranft ('06/EG)
- Ms. Anna L. Barnette ('06/EG)
- Dr. Jeffrey D. Rimer ('06/EG)
- Mr. Vikram K. Daga ('06/EG)
- Dr. Chi S. To ('06/EG)
- Mr. Dustin R. Ferretti ('06/EG)
- Dr. Naa L. McFarlane ('06/EG)
- Mr. Kevin W. Voit ('06/EG)
- Dr. Yakov Lapitsky ('06/EG)
- Dr. Claudio A. Gelmi ('06/EG)
- Ms. Lauren A. Buerkel ('06/EG)
- Ms. Aven D. Hyatt ('06/EG)
- Mr. Erich H. Bozenhardt ('06/EG)
- Mr. Thomas A. Simpson ('06/EG)
- Ms. Lindsey M. Argust ('06/EG)
- Mr. Mark J. Reichensperger ('06/EG)
- Mr. Mark A. Yocum II ('06/EG)
- Mr. Matthew A. DeSieno ('06/EG)
- Dr. Joseph M. Fedeyko ('06/EG)
- Mr. Michael J. Brenner ('06/EG)
- Mr. William J. Eskuchen ('06/EG)
- Ms. Becky E. Gable ('06/EG)
- Ms. Katelyn M. Thompson ('06/EG)
- Dr. Soumitra R. Deshmukh ('06/EG)
- Mr. Adam K. Foster ('06/EG)
- Dr. Noah G. McMillan ('06/EG)
- Mr. Daniel P. Miller ('06/EG)
- Mr. Robert J. Werner II ('06/EG)
- Dr. MariaGabriella Santonicola ('06/EG)
- Mr. Justin R. Spaeth ('06/EG)
- Dr. Gaurav Arora ('06/EG)
- Ms. Emily Peng ('06/AS)

For ChE Alumni News, visit [www.che.udel/alumni.html](http://www.che.udel/alumni.html)



# AIChE

## DELAWARE ALUMNI RECEPTION

Monday, October 17, 2011

Minneapolis Convention Center  
Minneapolis, MN

For alumni, friends, and special guests. No RSVP necessary.



[www.aiche.org/annual](http://www.aiche.org/annual)



Congratulations to  
Dion Vlachos for  
winning the 2011 R.  
H. Wilhelm Award in  
Chemical Reaction  
Engineering, Dion

will receive this award on:

*4:30p.m. Sunday, October 16, 2011  
The Honors Ceremony at the  
Minneapolis Convention Center*



Please join us for  
the Award Session  
of the American  
Electrophoresis  
Society in Honor of  
Kelvin Lee on:

*3:15 p.m. Wednesday, October  
19, 2011 Minneapolis Convention  
Center, Room 101E*



Please join us  
in honor of T.W.  
Fraser Russell the  
2010 W.K. Lewis  
Award Recipient  
for an honorary

symposium on:

*3:15 p.m. Monday, October 17, 2011  
Marquette II (Hilton Minneapolis)*



# DEPARTMENT

## Newark High applauds UD researchers for outreach to students

When members of the Newark High School Parent-Teacher-Student-Association (NHS-PTSA) wanted to enhance the science education curriculum at NHS to better prepare students for college, they turned to researchers at UD for help.

Over the last year, an interdisciplinary relationship has developed that is giving next-generation scientists and engineers at NHS a leg up over their peers, through hands-on research experiences and unique educational opportunities at UD. Mark Stitz, a researcher at UD Energy Institute, and Dion Vlachos, Elizabeth Inez Kelley Professor in the Department of Chemical Engineering and director of the Center for Catalytic Science and Technology, have established a comprehensive outreach program called the ChemE "Young Fellows Program." The program sparked the creation of a new science club at NHS called the NHS Science Scholars Club. Club members attend chemical engineering lectures on UD's campus about current research in catalysis, biofuels, alternate energy sources and other topics, exposing students to advanced laboratory equipment and research practices through site tours and interaction with UD graduate and doctoral students.

## Eric Kaler named President of the University of Minnesota

On July 1, 2011, Eric Kaler became the 16th president of the University of Minnesota. Kaler previously served as provost and senior vice president for academic affairs at Stony Brook University in New York, and vice president for Brookhaven affairs. From 1989-2007 Kaler was a faculty member at the University of Delaware, holding positions such as chair of the Department of Chemical Engineering and dean of the College of Engineering.

Among his many achievements, Kaler was elected to the National Academy of Engineering in 2010. In 1998, he received the American Chemical Society Award in Colloid or Surface Chemistry and in 1995 he was awarded the Curtis W. McGraw Research Award from the American Society of Engineering Education.

## Briefs

**HANK C. FOLEY**, vice president at Pennsylvania State University, will lead a \$159 million program to construct buildings that are considerably more energy-efficient. Many challenges lie ahead for Foley as he tries to make energy-efficient buildings that are also comfortable for people to live and work in.

Foley, previously a UD chemical engineering faculty member, has held several positions within Penn State including head of the department of chemical engineering, director of strategic initiatives, and dean of the College of Information Sciences and Technology.

**RICHARD GRAHAM** was awarded the **2011 ARTHUR B. METZNER EARLY CAREER AWARD**. He will receive this award at the 2011 Society of Rheology conference this October.

## Green Roof for Colburn Laboratory

The University of Delaware's first green roof, installed on Colburn Laboratory this spring, came about because **ANNETTE SHINE**, an associate professor of chemical engineering, and her students were too hot to concentrate.

Annette used to teach in Room 102, in an older section of Colburn with an HVAC system that's switched between heat and air conditioning twice a year. Invariably, there were unseasonably warm days in fall and early spring when Shine and her students sweltered.



It made it hard to focus on chemical engineering problems on the blackboard but one day it got Shine and her teaching assistant, Kathy Phillips, thinking about a different kind of engineering problem—would it be possible to put a green roof over their heads?

Shine knew that a green roof could be installed at a fraction of the cost of replacing the annex's old-school HVAC system. She did some research and discovered that a green roof planted to a depth of four inches could lower the

temperature in her classroom by six degrees or more, which could mean the difference between comfortable and attentive students or hot and distracted ones.

The environmental benefits of a green roof are significant. A 4,000-square-foot green roof reduces carbon dioxide emissions by more than one metric ton per year, primarily as a result of reduced summer air-conditioning demand.

"Our green roof will act as a 'sponge' to reduce storm water runoff by about 9,000 cubic feet per year," says Shine. "This

will improve water quality in the White Clay Creek and the Delaware River. But I believe one of the most important benefits will be that the 600 engineering students using Colburn 102 will see and feel first hand that 'green' solutions are viable options for solving engineering problems."

As it turns out, Chad Nelson, an assistant professor of landscape design, and student Aaron Hallett were trying to start a green roof project, too. The four teamed up and other students and staff soon joined in.

The most important order of business was a structural engineering study, which was funded by the UD Energy Institute. Each 2-foot by 2-foot module of plants now growing on Colburn's roof weighs 50 to 80 pounds after a rainstorm. Once the project is complete, there will be 900 modules, providing more than 3,600 square feet of greenery. That's a lot of weight on one roof, but the study indicated that

## Creating clean energy economy focus of UD conference

Creating environmentally friendly high technology jobs for Delawareans was the focus of the "Creating the Clean Energy Economy" conference, held Dec. 13-14, 2010 at the UD's Clayton Hall.

During his keynote luncheon talk, Delaware Gov. Jack Markell noted that the state "has the people who understand the values that these technologies offer. They understand how to work with the business community and they understand what the business community is looking for from its partners."

State government, Markell said, must partner with business and academia to create a workforce and an environment

that is attractive to those making decisions about where to locate new facilities, such as the a new sustainable office building under construction at DuPont's Chestnut Run site near Wilmington.

University President Patrick Harker welcomed attendees, including Markell, Kullman, U.S. Sen. Thomas Carper, former U.S. Sen. Edward "Ted" Kaufman, U.S. Sen. Chris Coons, U.S. Rep. John Carney and Secretary Collin O'Mara of the Delaware

Department of Natural Resources and Environmental Control.

Providing an overview of conference themes and objectives, **MICHAEL KLEIN**, director of the UD Energy Institute, said, "Clean energy is the grand challenge of the United States, and this is the nexus where opportunity meets needs. The talent that we have will develop the new technology that will power the new economy for the region and the nation."

the existing roof could safely handle it.

About 20 students helped to install 220 square feet of modules during the first phase of installation, two weeks ago. Tough, shallow-rooted sedums are the backbone of most roof gardens and Colburn is no exception. One module contains six-sided sedum interspersed with dragon's blood sedum, which has brilliant red flowers in late summer and green foliage that will turn orange-red in fall.

The plants were propagated at UD's Fischer Greenhouse and other locations by UD students, Girl Scouts, Master Gardeners and members of the Friends of the University of Delaware Botanic Gardens.

## Biomed engineering major growing trend nationwide

During a time of high unemployment, the university is working to educate future employees for one of the fastest-expanding fields: biomedical engineering.

A recently released Bureau of Labor Statistics report showed the relatively new field of biomedical engineering as one of the top fastest-growing occupations, with a 72 percent increase and 12,000 potential jobs by 2018.

The university's nationally ranked College of Engineering launched the biomedical engineering major in 2010. Professor Dawn Elliott has been hired from the University of Pennsylvania Perelman School of Medicine to head up the degree program.

This field, a combination of math, physics, chemistry and biology courses, was

available to engineering students as a concentration in previous years.

"It is biology and engineering with applications to medicine and disease, but there are a lot of broad applications as well," said Anne Robinson, graduate chair of biomedical engineering at the university.

Sophomore biomedical engineering major Nick Campagnola, who originally chose his major based on a desire to conduct cancer research, said he thinks he would like to go into medical device sales and train doctors how to properly use medical technology.

"I definitely think biomedical engineering sets me apart from just the typical biology major," Campagnola said. "I think this is going to give me an edge up."

Robinson attributed the field's rapid growth to current patient needs for artificial aids in medicine. As the baby boomer generation enters retirement age, its members will seek these aids, which are produced through biomedical engineering research, she said.

"We have a better handle on control and we have skills and more ability that we didn't have a decade ago," Robinson said.

## Eco-attire wins AIChE design award

Eco-friendly clothing and footwear has earned four University of Delaware undergraduates the 2011 Youth Council on Sustainable Science and Technology (YCOSST) P3 design award.

Given by the American Institute of Chemical Engineers' (AIChE) Institute for Sustainability, the award recognizes the UD research team's interdisciplinary collaboration and innovation in creating sustainable products.

The undergraduate research team included **QUAN DAN** from chemical engineering, and Paula Bonanno, Jillian Kramer and Stacey Lipschitz from fashion and apparel studies.

Richard P. Wool, chemical engineering professor and director of the Affordable Composites from Renewable Sources (ACRES) program and Huantian Cao, associate professor in fashion and apparel studies, advised the group with help from chemical

engineering graduate student Mingjiang Zhan.

While interdisciplinary work between chemical engineering and fashion might seem like a stretch, Wool said it is potentially the most beneficial ACRES collaboration to date.

"Using biobased foam in place of toxic polyurethanes could revolutionize the high polluting leather industry. It could also lead to new multidisciplinary graduate degrees between chemical engineering and fashion," he said.

The project is funded by the U.S. Environmental Protection Agency's P3 program, a national student design competition for sustainability focusing on people, prosperity and the planet. This year's competition was held April 16-17 on the National Mall in Washington, D.C.

## Anonymous donor gives \$10 million to support chemical engineering fellowships

A University of Delaware alumnus, who wishes to remain anonymous, has made an unprecedented investment in the future of graduate education at UD, gifting \$10 million to fund graduate fellowships in the Department of Chemical Engineering. It is the largest gift to the University from an individual since 1995 and the largest outright gift ever to the College of Engineering.

"This is an incredible gift," UD President Patrick Harker says. "It will elevate UD's chemical engineering program—already one of the best in the country—by helping us recruit the world's most talented doctoral students and fund discovery and innovation on a precedent-setting scale. Gifts like this can remake departments, colleges, entire universities. We couldn't be more grateful."

### ATTRACTING PROMISING SCHOLARS

High caliber students set reputable standards among peer institutions and enhance faculty research. They often bring further distinction to their alma maters as instructors, researchers and innovators. This gift will provide an endowed fellowship for approximately 20 incoming chemical engineering doctoral students for their first two semesters at UD, which is a significant honor for a scholar. This will allow monies typically spent to fund these students to be reallocated for other departmental priorities, thereby further expanding the impact of this gift. After the fellows' first two semesters, they will complete their studies with funding available through research grants in their area of focus.

This groundbreaking gift greatly enhances and enriches our ability to meet our department's mission of creating knowledge, educating students and serving society in the coming years," department chair Norman Wagner. "We are immensely thankful to this donor for believing so strongly in the impact our students have not only on our university, but in the world at large."

## Improved rankings

In accordance with the Path to Prominence, the College of Engineering is committed to redefining the excellence, intensity and breadth of research and of graduate and post-doctoral education available at the University.

The Department of Chemical Engineering at UD already offers world-class faculty and facilities, ranking within the top 10 finest programs in the nation. It consistently is one of the largest producers of chemical engineering doctorates in the U.S. and among the leading chemical engineering departments in research funding. Not surprisingly, the department's distinguished faculty includes 13 National Science Foundation CAREER or equivalent award winners, 13 named professors, three members of the National Academy of Engineering and three Alison Professors.

The addition of endowed graduate fellowships completes this circle, enabling the department and the college to improve rankings among peer institutions and attain greater levels of prominence, both nationally and internationally.

"This is a transformational gift for chemical engineering, the College of Engineering and the University. It allows us to compete for the most talented graduate students world-wide, an integral goal of the college's strategic plan," says former Dean Michael J. Chajes. "The gift is also a wonderful endorsement of the many great things that are happening in chemical engineering and throughout campus. We are most grateful to the donor for helping to propel us further along on the Path to Prominence."



## “Leadership and Entrepreneurship” course popular with students

### Lecturers needed for 2011-2012

A new course entitled “Leadership and Entrepreneurship” is creating mutually beneficial networking opportunities for undergraduates and esteemed alumni. Developed in 2010 by department chair Norm Wagner, the seminar series enables undergraduate seniors to interact with and learn from chemical engineering alumni and other experts with ties to the department, many of whom are world-recognized leaders.

### Among the invited 2010 speakers were:

- Ricardo Levy, Author of “Letters to a Young Entrepreneur”, Executive and Entrepreneur
- Jocelyn Scott, Chief Engineer and Vice President, DuPont Engineering, Facilities and Real Estate
- Mort Collins, (B, 1958) General Partner, Battelle Ventures and Innovation Valley Partners
- Jae Hyun, Professor, Department of Chemical and Biological Engineering, Korea University, Director, The Applied Rheology Center
- Bruce Robertson, (Ph.D., 1989)—Managing Director, H.I.G. BioVentures
- Gerry Estes, Vice President, Lord Corporation
- Tom Kovach, Esq., (B, 1992), New Castle County Council President, Delaware

Back by popular demand, the course is being offered for the fall 2011 semester and guest lecture opportunities are still available. If interested, please contact Norm Wagner.

## Academic outreach in Africa

**DOUG BUTTREY** spent four weeks at the African University of Science and Technology in Abuja, Nigeria (AUST-Abuja) teaching a master's level course in Thermodynamics in July 2011. He and interim Dean of Engineering, Babatunde Ogunnaike, have been visiting professors at AUST-Abuja each year since the university opened in the summer of 2008. This university is the first of a group of five pan-African campuses planned for sub-Saharan Africa under the organizational guidance of the Nelson Mandela Institution with support from the African Development Bank and the World Bank Group.



These new institutions are modeled after the successful system of Indian Institutes of Technology (IITs) with the expectation that AUST-Abuja and its sister campuses will contribute significantly to development needs across the continent by producing well-educated scientists and engineers. Two MSc graduates in Materials Science from AUST-Abuja visited UD for six months in 2010, and one (Tony Ogbuu) has been admitted to the UD Ph.D. program in Materials Science and Engineering for fall 2011.

# Emerging thrust in Biochemical and Biomolecular Engineering

Starting under the direction of former chair Mark Barteau, the Department has implemented a strategic plan to grow by building a world-class group of biochemical and biomolecular engineers through strategic hiring and securing major research funding in the area. Building on its long tradition of research and education excellence, the Chemical Engineering Department at the University of Delaware (UD) has developed biochemical & biomolecular engineering into one of the largest and strongest programs available both nationally and internationally. We are grateful for the strong support we have received from the University and our alumni in expanding into this critically important field of research.

Our core faculty have established substantial research efforts and state-of-the-art laboratories at UD. We are building the fast growing fields of synthetic biology, stem-cell biotechnology, metabolomics, systems biology and biofuels, and expanding

UD's research activities in all frontier areas in modern BioChE,, both within chemical engineering, as well as through extensive collaborations across campus and nearby medical centers.

## BIO RESEARCH AREAS

- *Biomolecular, Cellular & Protein Engineering*
- *Metabolic Engineering & Synthetic Biology*
- *Biofuel & Biorefinery Technologies*
- *Experimental Genomics, Proteomics & Metabolomics*
- *Neurodegenerative Diseases*
- *Stem-Cell & Tissue Engineering*
- *Systems Biology & Computational Genomics*
- *Computational Biology & Signaling Networks*
- *Biomaterials & Drug Delivery*
- *Bio-Nanotechnology*
- *Protein Biophysics & Bioseparations*



**CORE FACULTY INCLUDE:** Maciek Antoniewicz, Wilfred Chen, David Colby, April Kloxin, Kelvin Lee (also director of the Delaware Biotechnology Institute), Bramie Lenhoff, Terry Papoutsakis, Chris Roberts, Anne Robinson and Millie Sullivan. Research activities in biochemical and biomolecular engineering now comprise nearly 1/3 of the total within our greatly expanded department.

This growth includes new, innovative educational opportunities that include the popular minor in biochemical engineering, a bioprocessing senior laboratory experiment and experimental advanced undergraduate and graduate classes.

## 2011 Seminar Series

### FRIDAY, MARCH 4, 2011

**JOHN KITCHIN**—Allan P. Colburn  
*Memorial Lecture*; Assistant Professor,  
Chemical Engineering, Carnegie Mellon  
University  
*"Oxygen Evolution on Multicomponent  
Oxide Electrocatalysts"*

### FRIDAY, MARCH 18, 2011

**CHAITAN KHOSLA**—Robert L. Pigford  
*Memorial Lecture*; Chair, Chemical  
Engineering; Wells H. Rauser and  
Harold M. Petiprin Professor in the School  
of Engineering, Stanford University  
*"Modular Biocatalysts"*

### FRIDAY, APRIL 8, 2011

**MICHAEL DOHERTY**—Chair and Professor,  
Chemical Engineering Department  
University of California, Santa Barbara  
*"Crystal Shape Engineering for  
Organic Materials"*

### FRIDAY, April 22, 2011

**RAVI KANE**—P.K. Lashmet Professor of  
Chemical and Biological Engineering  
Rensselaer Polytechnic Institute  
*"The Design of Nanoscale Therapeutics and  
Nanostructured Materials"*

### FRIDAY, APRIL 29, 2011

**NICHOLAS PEPPAS**—Kurt Wohl  
*Memorial Lecture*; Fletcher Stuckey  
Pratt Chair in Engineering; Professor of  
Chemical Engineering; Chair of Biomedical  
Engineering; The University of Texas at  
Austin *"Intelligent Biomaterials for Protein  
Delivery, Molecular Recognition and  
Advanced Medical Devices"*

### FRIDAY, MAY 13, 2011

**LEVI THOMPSON**—Richard E. Balzhiser  
Collegiate Professor of Chemical  
Engineering, University of Michigan  
*"Towards Sustainable Hydrogen Production:  
Design and Synthesis of Nanostructured  
Materials"*

### FRIDAY, SEPTEMBER 9, 2011

**KLAUS JENSEN**—Robert L. Pigford  
*Memorial Lecture*; Head and Warren K.  
Lewis Professor of Chemical Engineering  
Department of Chemical Engineering  
Massachusetts Institute of Technology  
*"Shrinking and Accelerating the Lab—  
Microreactors in Discovery  
and Development"*

### FRIDAY, SEPTEMBER 23, 2011

**DAVID SCHAFFER**—Professor,  
Department of Chemical and Biomolecular  
Engineering  
*"Molecular Engineering of Extrinsic and  
Intrinsic Cues to Control Stem Cell Function"*

### FRIDAY, SEPTEMBER 30, 2011

**WILLIAM BENTLEY**—Chair and  
Robert E. Fischell Distinguished Professor  
The Fischell Department of Bioengineering  
The University of Maryland  
*"Biofabrication for Interrogating and  
Modulating Biological Signaling: Honing in  
on Quorum Sensing"*

### FRIDAY, OCTOBER 14, 2011

**SILVINA TOMASSONE**—Associate  
Professor, Rutgers University  
*"Multiscale Molecular Simulations on  
the Dispersion and Rheology of Silica  
Nanoparticles in a Polyethylene Melt"*

### FRIDAY, NOVEMBER 4, 2011

**NICHOLAS ABBOTT**—Kurt Wohl  
*Memorial Lecture*; John T. and  
Magdalen L. Sobota Professor; Department  
of Chemical and Biological Engineering  
University of Wisconsin-Madison  
*"Colloidal and Interfacial Phenomena  
in Liquid Crystalline Systems"*

### FRIDAY, NOVEMBER 18, 2011

**ROBERT DAVIS**—Chair and Earnest  
Jackson Oglesby Professor and Department  
of Chemical Engineering, University of  
Virginia  
*"Some Current Challenges in the Conversion  
of Biorenewable Molecules over Supported  
Metal Catalysts"*

# Robert L. Pigford

Robert L. Pigford was born on April 16, 1917 and was raised in Meridian, Mississippi. At home he constructed model airplanes and a crystal set, and as a teenager assembled the first of an unending array of ham radios. He was a keen musician and a leader in his high school, University and ROTC bands.



He received a B.S. degree in chemical engineering from Mississippi State College in 1938. In 1939 he married Marian Pinkston while at the University of Illinois where he earned his M.S. in 1940 and his Ph.D. degree in 1942.

His next six years were spent in the Engineering Research laboratory at the duPont Experimental Station, working on both civilian and military research

problems. The Laboratory Director at that time was Thomas H. Cilton and with his industrial colleagues, Dr. Pigford participated in that was to become one of the national centers for renaissance in engineering education, in which the group replaced approximate analyses guided by experiment with careful, quantitative models of the chemical and physical processes being considered. His association with the University of Delaware began shortly after his arrival in the State when he began organizing these new analyses into evening and weekend courses for chemical engineering students on campus. One result of this activity was a textbook "Application of Differential Equations to Chemical Engineering Problems" which he co-authored with W. R. Marshall.

In 1947 Allan P. Colburn persuaded Dr. Pigford to come to the University of Delaware on a full-time basis, so at the age of

30 he became Chairman of a fledgling Chemical Engineering Department that was to develop rapidly under his influence and leadership to become a nationally respected department. From 1966 to 1975 Dr. Pigford served as Professor of Chemical Engineering at the University of California at Berkeley but his association with the University of Delaware spanned more than thirty years until his retirement in 1987.

Dr. Pigford was a dedicated educator who had an impact on the engineering profession worldwide, through his exemplary books, lectures, and research papers and through the activities of a large core of former students who came to Delaware to work and study with him. He was one of the earliest proponents of the use of computers in engineering, and built several for instruction and research before they became widely available. His colleagues remember the numerous hurdles he had to overcome not only to persuade administrators of the need for these expensive new tools of science and technology, but also for the carefully air-conditioned rooms they required in an era when such luxuries were not available for campus personnel.

Dr. Pigford's advice was sought by numerous industrial, academic and government institutions. He served as a member of the US Army's Advisory Council, the Scientific Advisory Board of the US Air Force, the Department of Energy, and the National Research Council, as well as serving as a member of the Advisory Committees for Chemical Engineering at Princeton University and Massachusetts Institute of Technology. He received virtually all the national awards of the American Institute of Chemical Engineers and served as Director of that organization from 1963 to 1966. In 1983, on the occasion of the AIChE's 75th anniversary, he was named as one of 30 distinguished leaders of the profession. He was elected to the National Academy of Engineering in 1971 and to the National Academy of Sciences in 1972. In 1977 the University of Delaware named Dr. Pigford as its first Alison Scholar in recognition of his exemplary contributions, and in 1983 he was appointed to the University's Board of Trustees.



## Past Robert L. Pigford Seminar Speakers

1992

### ANDREAS ACRIVOS

Albert Einstein Professor of Science and Engineering, Director, The Benjamin Levich Institute for Physico-Chemical Hydrodynamics  
The City University of New York

1993

### L.E. (SKIP) SCRIVEN

Regents Professor of Chemical Engineering, Department of Chemical Engineering and Materials Science  
University of Minnesota

1994

### L. GARY LEAL

Professor and Chair, Department of Chemical and Nuclear Engineering  
University of California, Santa Barbara

1995

### MARK BARTEAU

Robert L. Pigford Professor  
University of Delaware

1996

### DONALD R. PAUL

Melvin H. Gertz Regents Chair of Chemical Engineering  
University of Texas at Austin

1997

### R. BYRON BIRD

Vilas Professor Emeritus, Department of Chemical Engineering  
University of Wisconsin-Madison

1998

### L. LOUIS HEGEDUS

Vice President, Research and Development  
Elf Autochem North America

1999

### ELI RUCKENSTEIN

Distinguished Professor of Chemical Engineering  
State University of New York at Buffalo

### ROBERT BROWN

Warren K. Lewis Professor and Provost  
Massachusetts Institute of Technology

2000

### STUART CHURCHILL

Carl V.S. Patterson Professor Emeritus of Chemical and Biomolecular Engineering  
University of Pennsylvania

2005

### ADAM HELLER

Professor Emeritus  
University of Texas at Austin  
Thomas F. Kuech  
Milton J. and A. Maude  
Shoemaker Professor  
University of Wisconsin-Madison

2006

### WILLIAM BANHOLZER

Dow Corporate Vice President and Chief Technology Officer  
Dow Chemical Company

2007

### SANGTAE KIM

Donald W. Feddersen  
Distinguished Professor  
Purdue University

2008

### JEFFREY A. HUBBELL

Professor  
Swiss Federal Institute of Technology (EPFL)

2009

### MARK E. DAVIS

Warren and Katharine Schlinger Professor of Chemical Engineering  
California Institute of Technology

2010

### JOSEPH DESIMONE

William R. Kenan, JR. Professor of Chemical Engineering  
North Carolina State University

### DR. GREGORY STEPHANOPOULOS

W. H. Dow Professor of Chemical Engineering and Biotechnology  
Massachusetts Institute of Technology

2011

### CHAITAN KHOSLA

Wells H. Rauser and Harold M. Petiprin Professor and Chairperson  
Stanford University

### KLAUS JENSEN

Head of the Department of Chemical Engineering, Warren K. Lewis Professor of Chemical Engineering  
Massachusetts Institute of Technology

# Thank You Alumni & Friends

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